

The Grain Market in the Roman Empire

A social, political and economic study

PAUL ERDKAMP



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THE GRAIN MARKET IN THE ROMAN EMPIRE

This book explores the economic, social and political forces that shaped the grain market in the Roman Empire. Examining studies on food supply and the grain market in pre-industrial Europe, it addresses questions of productivity, division of labour, market relations and market integration. The social and political aspects of the Roman grain market are also considered. Dr Erdkamp illustrates how entitlement to food in Roman society was dependent on relations with the emperor, his representatives and the landowning aristocracy, and local rulers controlling the towns and hinterlands. He assesses the response of the Roman authorities to weaknesses in the grain market and looks at the implications of the failure of local harvests. By examining the subject from a contemporary perspective, this book will appeal not only to historians of ancient economies, but to all concerned with the economy of grain markets, a subject which still resonates today.

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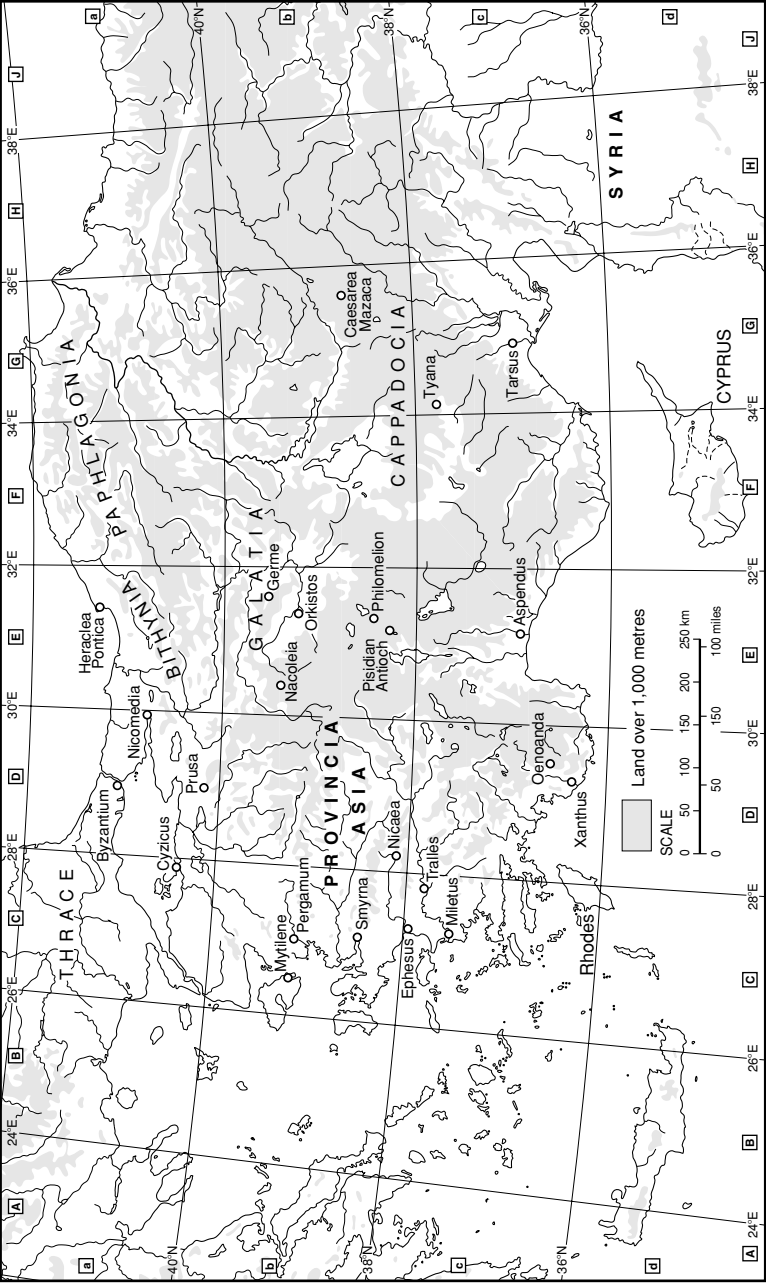
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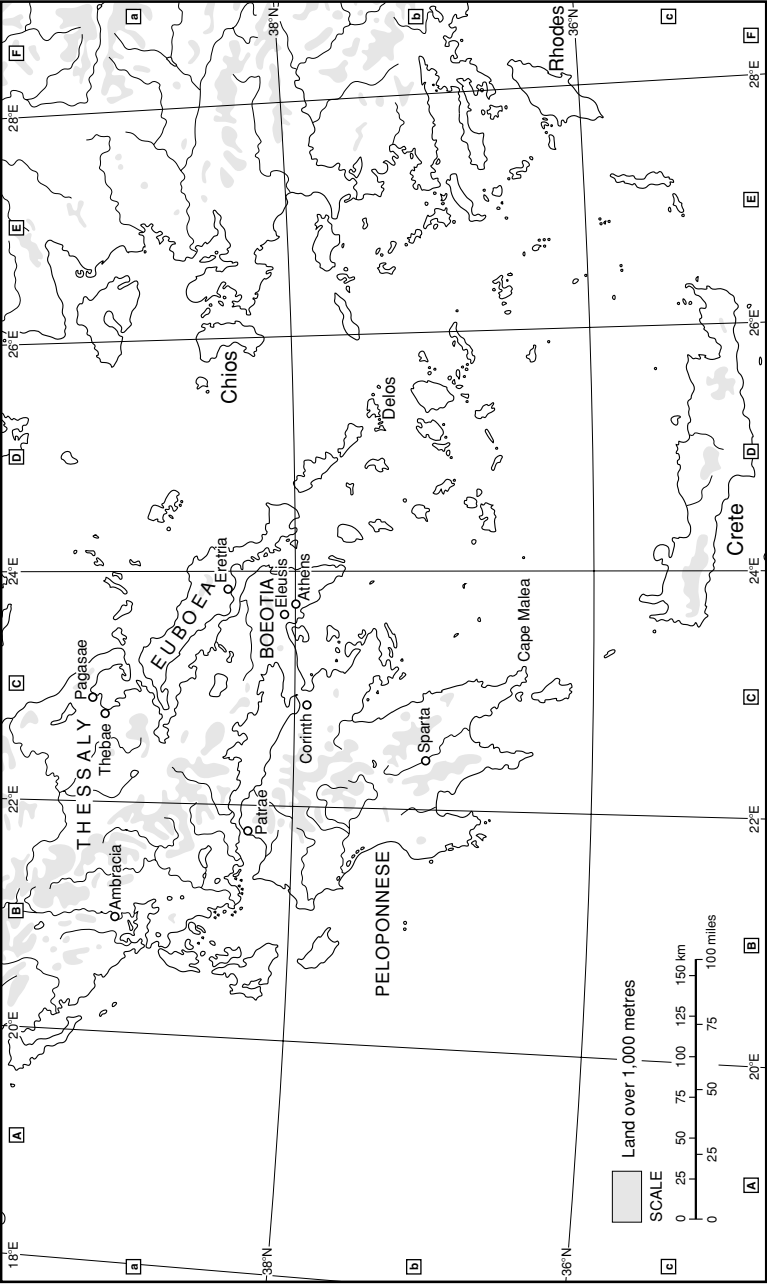
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Map 1. Asia Minor.



Map 2. Greece.



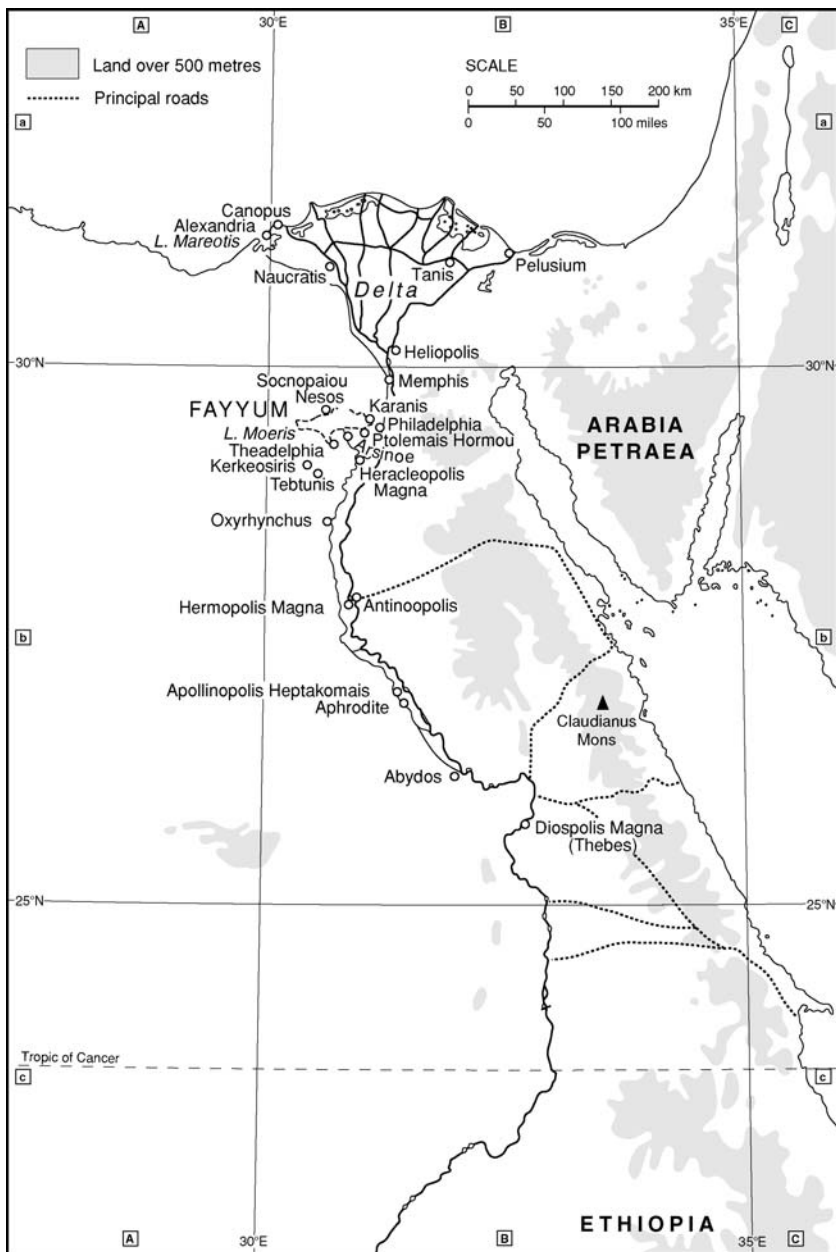
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Introduction

The word ‘market’ may mean three things: first, the place at which the commercial exchange of goods takes place; secondly, the forces of supply and demand that govern the commercial distribution of goods. ‘Market’ in the second sense gives rise to another meaning of the word: the geographical area in which the commercial exchange of certain goods operates. This book is mainly concerned with the market of grain in the second and third senses. The reader may be expecting to find an analysis of the price formation of various grains, a survey of the short-term trends and long-term developments of prices and real wages, a study of the processes of the cereal market, and a quantitative outline of imports and exports of grain between agricultural regions and structural markets. However, the reader should be warned that the present study of the grain market in the Roman world contains little of the above. This is not by choice, but by necessity: the ancient sources simply contain insufficient data to undertake an analysis of those aspects of pre-industrial societies that most economic historians of later times regard as essential.

The reason is that most ancient sources are literary texts, which include not only works of philosophy, history, novels and letters, but also legal writings and texts inscribed on stone. Even Egypt, while offering by far the most quantitative evidence on the ancient world, does not yield sufficient documentary sources to undertake a serious attempt at statistical analysis (except maybe on demography). The evidence on much of the Mediterranean region is limited to literary writings, which usually offer a picture of how things were perceived to be or of how they should have been, not of how they were. The relevance of the writers of the agricultural handbooks to agricultural reality, for instance, is based on the assumption – probably justified, it must be stressed – that these authors had first-hand knowledge of – and thus reflected – commercial farming as it was practised in Italy in their days. Nevertheless, one should be sceptical regarding the degree to which their prescriptive accounts shed light on the

farms of smallholders. Even more important is their choice of subjects to discuss – and to ignore. The marketing of produce, on which the profitability of the landed estates was ultimately based, is a subject that was left out by Cato, Varro and Columella. The picture painted by individual landowners (such as Pliny the Younger) of their estates and the marketing of their produce is even more fragmented and obviously distorted. Their information is meagre in comparison to what even a brief glimpse of their accounts would have offered. The grain supply of the city of Rome can be studied in more detail than that of any other city of the Roman world, but still is largely known from sources that merely describe what should have been – not what was. Quantitative evidence is rare even concerning Rome, which gives those few solid figures that our sources mention undue weight in the discussion. The legal writings and inscriptions containing laws and regulations on the grain market and urban food supply in the rest of the Empire are by their nature one-sided. In short, we have a very fragmented and one-sided view of a construct, and hardly any evidence of the historic reality. The contents of this book have been shaped by what the sources reveal – and do not reveal.

However, good research should be based on the questions that are asked, and not on what the sources say, although there is admittedly little point in asking questions that cannot be answered. The questions that are asked in this book concentrate on the role of the distribution of grain in the economic, social and political structure of the Roman world. In recent decades, many excellent publications have appeared on the food supply in the Graeco-Roman world, beginning with Geoffrey Rickman's *The Corn supply of ancient Rome* (1980). Soon followed Peter Garnsey's *Famine and food supply in the Graeco-Roman world* (1988) and Peter Herz' *Studien zur römischen Wirtschaftsgesetzgebung. Die Lebensmittelversorgung* (1988). Both covered much ground, and many books and articles on matters of food supply followed in their wake. Repetition of what has already been said has often been unavoidable. The reason for writing this book is that the current literature on food supply in antiquity is partly based on a few ill-founded assumptions on the production and distribution of grain. As studies of early modern Europe show, food supply is part of economics, but that aspect seems missing from most publications on food supply in antiquity, which may be due to the nature of the sources.

This book intends to put more emphasis on the economic aspects of the production and distribution of grain. The grain market may be described in two ways, by its institutions and by its functions. The emphasis will be on functions, not on institutions. The main themes

derive from studies on food supply and the grain market in later times: productivity, division of labour, market relations and market integration. These studies show that the degree to which the market was able to offer security in supplying food was a crucial factor in the degree to which pre-industrial economies could lift themselves off the ground. Other authors would undoubtedly have written a different book, and the present book will probably be criticised for the subjects that are omitted. I do not deal, for instance, with famine and malnutrition, nor with cultural aspects of food and dining. One reason for these omissions is that I intended not to explore topics on which I felt I had nothing new to add. Hopefully the subjects that are discussed in this book succeed in offering a new perspective on a well-discussed subject.

Economic emphasis, it may be added, does not exclude social and political aspects. Previous studies have made clear that in a society where production levels of food were low and precarious, entitlement to food was a fundamental precondition of survival, as it still is in some under-developed parts of the world. In his analysis of twentieth-century famines in the Third World, the economist and Nobel prize winner Amartya Sen stressed the diverse nature of the entitlement to food of various segments of societies. In his view, entitlement to food can be based on direct production, on the market exchange of goods or services for food, but also on social and political rights.¹ Disturbances disrupt each of these various forms of entitlement in various ways and to different degrees. Sen makes clear that food supply is not solely an economic matter of production, distribution and transport, but should also be seen in the light of political and social relations within a particular society. The Roman Empire is no exception in this regard. The food entitlement of many segments of Roman society depended on their direct and indirect relations with the emperor and his representatives, and with the landowning aristocracy and local rulers, who controlled the towns and much of their hinterland.

The ancient sources constantly emphasise social and political aspects of food supply. Even stronger: as far as we may judge from the writings of those authors who made food supply a subject of discussion, they saw it solely as a social and political issue. Plato's *Laws* offers a clear example. Plato's ideal state is divided into three classes. The food supply of these three classes is based on non-market channels, while trade is only assigned a marginal role:

¹ Sen (1981) 43.

Take wheat or barley, for instance (though the same procedure must be followed for all the other crops too, as well as for any livestock there may be for sale in each district): each twelfth part [one part for each month] should be split proportionately into three shares, one for the citizens, one for their slaves, and the third for workmen and foreigners in general (i.e. communities of resident aliens in need of the necessities of life, and occasional visitors on some public or private business). It should be necessary to sell only this third share of all the necessities of life; there is no necessity to sell any part of the other two.²

Admittedly, this text does not reflect any reality, except that of the ideal state as envisioned by Plato. In his view, the main purpose of the distribution of the produce of the land was to feed the community of citizens and their households, and this was ideally done by direct and equal distribution, not involving market channels, which were – not surprisingly – only assigned a role in supplying food to those people who were outside the community.

Equally revealing is Aristotle's analysis of economic transactions in his *Nicomachean Ethics*. In the words of J.A. Schumpeter: 'Starting from the economy of self-sufficient households, he [Aristotle] then introduced division of labor, barter, and, as a means of overcoming the difficulties of direct barter, money . . . There is no theory of "distribution".'³ Both Plato and Aristotle only had a very basic idea of distribution as an economic concept. According to both philosophers, trade and profit were 'unnatural' and ideally excluded from the social and political community of citizens. The modern arguments that trade as a means of distribution enhanced the economic value of goods by distributing them to those people who offered most in return, and that profit was a justifiable reward for this service were foreign ideas to Plato and Aristotle.

Although the modern term 'economy' derives from the Greek, it has little to do with what the ancient writers meant by such a term. The principal elements stressed in Xenophon's *Oikonomikos* are knowledge of farming practices, the sale and purchase of arable land and the proper management of one's household, which comprises not only one's workforce, but also one's family. The Greek term was limited to the functioning of a household and the relations between households. The perspective that our sources offer on this subject is that of a landowning elite. Hence, the household they discuss was that of a well-to-do family, including the workforce that worked on their farm. The emphasis of this economic unit is not on marketing and commerce (as in modern economics) but on

2 Plato, *Laws* 848a. Transl. by Saunders (1970).

3 Schumpeter (1954) 53.

production. The same attitude is shown in the Roman agricultural manuals, which cover every aspect of production on a commercial farm, but consciously ignore the marketing of the estate's produce. This is not to say that Roman landowners had no interest in marketing or profit, but it required no sophisticated ideas about the market to make profit, just as it did not require having an economic theory of interest to charge interest in daily life.

There is little sign of a truly economic policy regarding food supply in antiquity. This is not to say that the central government or local rulers disregarded matters of food supply. On the contrary: the sources clearly indicate the importance that rulers attached to the supply of grain to cities and armies. Xenophon for instance urged statesmen to pay attention to matters of food supply,⁴ but this did not imply an economic policy in the modern sense. Likewise, Pliny the Younger praised Trajan's policy of building roads and improving harbours, but he did so in the context of Rome's grain supply.⁵ Commerce, infrastructure, exports and imports were seen as direct means to a limited end, not as the subject of economic policy.⁶ The landowning elite dominated their communities economically, socially and politically, but there is no evidence of a policy that took the agricultural interests of landowners to heart. There were no export bonuses or import barriers, like there were in early modern Europe. This is as true of Classical Greece or the Hellenistic kingdoms as of the Roman Empire: 'If a Greek city took into account the economic interests of its members, it was solely as consumers and not as producers. . . . What they practised was solely an import not an export policy.'⁷ In one sense at least the Roman world was significantly different from early modern Europe: there were no nation-states. Hence, there were no national policies concerning the international grain market. Roman customs duties worked both ways: the same percentage had to be paid, whichever way one was crossing the boundary. To the Roman government, customs duties were merely a source of income, not a way to enhance the grain market or to protect the internal profitability of agriculture.⁸

4 Xenophon, *Mem.* 3.6.13.

5 Pliny, *Pan.* 29. Cf. Rathbone (2000) 52, who points out that even the Ptolemaic reclamation of the Fayyum was in the end primarily an 'immortal memorial' for the new dynasty.

6 Likewise Schneider (2000) 62: the infrastructure was created not to serve the needs of traders, but to facilitate the supply of the cities.

7 Austin and Vidal-Naquet (1973) 113. Cf. Bleicken (1988) 99.

8 In contrast to early modern Europe. See for instance Outhwaite (1981) 398ff concerning England. On *portoria*, see for instance Von Freyberg (1989) 56ff, who argues that only the higher custom

The only example of governmental involvement in trade that has the appearances of mercantilistic policy is the vine-edict of the emperor Domitian, who ordered the destruction of provincial vines, while forbidding their planting in Italy.⁹ However, Suetonius shows that the vine-edict (which was, moreover, never implemented) was conceived during a shortage of grain. Hence, Domitian did not intend to protect the interests of Italy's vineyards, but to enhance the supply of grain. If anything, the vine-edict demonstrates the predominance of the consumers' interests, even if nothing much came of it. Suetonius informs us furthermore that Augustus had considered abolishing the *frumentationes*, 'because through dependence on them agriculture was neglected'.¹⁰ He decided against the idea, believing that the corn dole would eventually be restored to please the masses. In the end, Suetonius writes, Augustus devised a system that kept the interests of farmers and merchants as well as those of the people in mind. Balancing the interests of producers and traders with those of consumers is the best evidence of an economic policy that the ancient sources have to offer. Despite their political influence, the landowners' pursuit of profit never turned to protectionism.

To the rulers as much as to the writers of the Roman world, the food supply was a social and political issue, which is also seen in the urban bias of the measures that were taken or conceived. The attention of the Roman authorities and local rulers towards food supply was largely based on the social status of the consumers. Rome surpassed any other city in the Roman world in social status and political importance, which is reflected in the extraordinary measures that were taken to provision the capital with grain and bread. The administrative channels that supplied the city of Rome with grain largely by-passed the market. Also the grain supply of the other cities of the Roman world cannot be studied without keeping in mind social and political aspects. However, the grain supply of these cities was largely determined by the economic realities of production and trade and should be seen in the context of the economic factors that determined the workings of the grain market. Even stronger, the intervention of central authorities and local rulers in the grain supply of the towns and

duties on the outer boundaries of the empire can be seen as part of a 'trade-policy'. Similarly, Van der Spek (2000a) 34 concludes regarding the Seleucid Empire that 'the fiscal policy was not intended to protect industries, but only to secure income'.

9 Suetonius, *Dom.* 7.2. Commentary: Wiemer (1997) 212ff. Measures taken by Hadrian that restricted the planting of vines on arable land on imperial domains in Egypt and Africa may offer a limited parallel to Domitian's edict. BGU 11.2060; CIL 8.25943; 26416.

10 Suetonius, *Aug.* 42.3.

cities was a response to the limitations of the grain market on which the sustenance of their inhabitants depended. This response had to reckon with the economic realities of the grain market, but that does not make their policy an economic policy. Governmental measures either regulated the workings of the market or supplemented it by actions that made use of non-market channels. It was precisely the weakness of market channels that increased the importance of non-market mechanisms of distribution. Although the main subject of this book is the grain 'market' in the Roman world, much attention will necessarily be given to non-commercial distribution of grain.

The main themes of this book derive from studies on the food supply and grain market in later times, in particular in pre-industrial Europe. The reason for the emphasis on pre-industrial Europe is twofold. First, the geographical and climatic conditions in which the economy of the Roman world took shape are most closely paralleled in the Mediterranean countries of the early modern era. The physical setting of the Mediterranean region was a very important factor in shaping the economy of the societies that developed in the region. Climate, vegetation and geographical features placed constraints on the way that people made their livelihood. However, I do not propose a kind of geographical determinism in explaining economic structures. In past decades, many publications on the ancient world stressed the adverse conditions of agriculture. Nineteenth-century publications on the economy of such regions as Spain and southern Italy did the same. At the end of that century, Spanish agriculture was among the lowest in productivity in Europe. In 1890, Lucas Mallada published his *Los males de la patria*, in which he blamed the low level of productivity on the adverse conditions of topography, climate and soil. His book was popular and influential, because it offered an apologia for Spanish backwardness. Such a deterministic approach, however, has been rejected in more recent studies. James Simpson, for instance, points out that 'a prosperous agriculture is the result not so much of favourable soil fertility or climate, but rather a function of the intensity in which labour, capital and technology is applied, and the nature of society's demands on the soil.'¹¹ Although knowledge of the soil, climate and topography in the Mediterranean lands of antiquity is necessary to understand the environmental restraints under which farming, husbandry and transport functioned, Simpson's statement emphasises the importance of

11 Simpson (1995) 34.

economic structures in understanding agriculture and food supply in the Roman world.

Secondly, the aim of using comparisons in historical research is to go beyond the limited scope of one's sources. The use of comparisons in studying the economy of the ancient world would advance us little further if comparisons were made with societies, the sources on which are as scarce, fragmented, one-sided and biased as those regarding antiquity. Economic research in early modern Europe is based on sources of sufficient quality and quantity to allow the construction of more refined models and the formulation of more precise concepts than the sources on the ancient world will ever allow. Hence, the analytical tools that are used in this book are those that are applied by economic historians to the societies of late medieval and early modern Europe. The point of comparison is not always to stress similarities. Differences in certain aspects may be just as illuminating, when the causes of these differences are explored.

This study treats the Roman world as a pre-industrial society that was not fundamentally different from early modern Europe. The question may be asked whether the themes, concepts and analytical tools that are useful in economic studies of societies from the late Middle Ages onwards are applicable to antiquity. The fact that the ancient authors did not develop an economic theory does not of course need to be an objection. Economic behaviour did not depend on having a theory about it. Moreover, the models and concepts used in economic research are not just applicable in studies of modern societies. If capitalism is defined as an economy in which goods are produced for the market with the aim of making a profit, this definition can surely be applied to the Roman world, provided one realises that making a profit was not the only – or even the most important – aspect of the economy.

If the pre-industrial economy is sufficiently uniform to mark an era that can be said to have started in the Mediterranean region at some time during the Graeco-Roman period and to have lasted until the nineteenth century, it needs to be differentiated on the one hand from less developed economies, and on the other from the industrialised, capitalistic global economy of modern days. A few of its distinguishing features may be sketched thus:

First, agriculture was by far the predominant sector within the economy, and in both the Roman world and early modern Europe, agriculture was dominated by the cultivation of grain. Braudel used a simple, but effective calculation to express the economic importance of grain. Assuming a

population in the Mediterranean region of some 60 million people, who each consumed approximately 200kg of corn annually, and taking a 'normal' grain price in Venice to express its monetary value, he estimated that the value of corn consumed each year was about 480–600 million ducats. Compared to this, he said, the famous import of gold from the Americas to Seville – estimated at 6 million annually – was insignificant.¹² A similar calculation could easily be made regarding the Roman world. This agricultural dominance does not imply an undifferentiated autarkic economy. Although the largest part of the grain that was produced was consumed by those who produced it, a large proportion was not.

Secondly, a characteristic feature is the nature of the division of labour. The Roman economy is distinguished from less-developed economies primarily through a significant increase in the division of labour and the emergence of markets on which this division of labour was economically based. As a result, the population did not consist almost exclusively of farmers. It will be argued that the engagement of the largest part of the population in agriculture does not exclude a significant involvement in non-agricultural activities. Hence, the figure that is usually given for the Roman world concerning the division of labour of 80 or 90 per cent of the population engaged in agriculture is deceptive in that it plays down the importance of the non-agricultural sectors of the economy.

Thirdly, the nature of the market. Farmers were not autarkic cultivators of the soil, but they functioned in a context of markets. These markets not only included product markets, i.e. markets of the crops and goods they produced, but also factor markets, that is markets of land, capital and labour. The markets of land, capital, labour and products were inflexible and weak, and thus had to be supplemented by non-market channels. The response of urban authorities to the weakness of the food markets in early modern Europe was remarkably similar to that of urban rulers in the Roman world. Coercion played an important role in the Roman world, and much of the economic growth that can be seen in the first centuries AD can be ascribed to a 'command economy', but there was a significant difference from the distributive economies of the cultures of the Near East. Despite the importance of taxes and rent in distributing capital and goods, the Roman economy was a market economy, although that is not to say that the Roman world ever developed an integrated 'world economy'. Much of the complexity of Roman society, and of its spectacular

12 Braudel (1966) 420f.

achievements (such as having given rise to the largest city in Europe until nineteenth-century London) was built on the use for specific purposes of coercive, non-market channels within a market context.

Fourthly, transportation over land depended on the energy provided by humans and animals, transportation by water largely on wind and current. Bulk goods, including food, could not be transported long distances overland before the introduction of railways. This imposed a powerful constraint on the degree to which people could participate in the market exchange of goods and on the extent of the geographical area in which the exchange of certain goods operated. Communication and information depended on travel, which severely limited its range and speed. This was also a limiting factor in the commercial exchange of goods. Because of the risks and costs involved, large-scale and long-distance distribution of bulky commodities was often based on coercive, one-way flows of goods.

The present study puts the grain market in the wider perspective that is sketched above. The discussion will start with an investigation of the input of production factors in cereal farming in the Roman world and the degree of surplus production. An overview of the means of production – land, capital and labour – and an analysis of agricultural practice will show that agricultural productivity was not so much determined by a low technical level of agriculture, as is often assumed, but by the variation in the balance between production factors on the farms of smallholders and commercial estates, which resulted in a low labour productivity in peasant farming. Chapter [two](#) explores the context of the employment of labour in peasant households. The main conclusion is that the limitations of the non-agricultural economy forced the households of smallholders to concentrate their labour on agriculture, resulting in low labour productivity.

The next two chapters deal with the involvement of the various groups of producers in the commercial exchange of grain. Chapter [three](#) discusses the market relations of commercial, large-scale farmers and of the peasantry. The farms and estates of the wealthy landowners were orientated towards the market. Discussion of marketing considerations will not be limited to grain, but also include wine and olive oil. Chapter [four](#) gives an assessment of the extent of market integration in the Roman world. Market integration refers to the extent to which the market was able to connect supply and demand in space and in time. This chapter will first discuss market integration in time (i.e. carry-over) and show that the extent of integration between harvest years was low. The second part of the chapter will analyse the factors that determined market integration in space. It will be argued that the costs of transportation, the limitations of

communication and the unequal development of commercial networks severely limited the degree to which local inequalities in supply and demand were connected.

Urban grain supply is discussed in chapters [five](#) and [six](#). The city of Rome remains a special case, which has to be understood in the context of coercive channels of distribution of grain. On the one hand, it is shown that the role of Sicily and Egypt in the long-distance distribution of grain was largely related to taxation, which left little scope for the commercial distribution of their surpluses. On the other, it is argued that the supply of Rome was largely based on imports of tax-grain. Chapter [six](#) deals with the urban food market in the towns and cities of the Roman world and the nature of the regulation that was intended to overcome the weaknesses of the grain market.

Production and productivity in Roman agriculture

It is a commonplace that in antiquity about 80 per cent of the population were engaged in agriculture, leaving only 20 per cent for all other sectors of the economy. Often a direct causal link is made between agricultural productivity and the division of labour, as for instance by H. Schneider in his assessment of ancient agriculture. He claims that, before the introduction of artificial fertilizer and machines, such as the combine harvester, agricultural productivity was extremely low: about 80 per cent of the population had to work the land in order to fulfil the entire society's needs for food and other agricultural produce.¹ A direct link is made between a low level of agricultural productivity and the large proportion of people working the land. The estimate of the basic division of labour in the Roman world is undoubtedly generally about right.² It is also correct to assign food supply a determining role in the structure and scale of the wider economy. However, it is wrong to see the limitations of agricultural production as an almost natural and inescapable barrier to further growth of the non-food producing sectors of the economy.

In an important study of the division of labour in pre-industrial France, G.W. Grantham has pointed out the discrepancy between the proportion of the population that was employed in agriculture and agricultural productivity. 'The share of the population strictly required to sustain a minimum level of subsistence was probably at most 40 per

1 Schneider (2000) 55f: 'Vor die Einführung der künstlichen Düngung und solcher Maschinen wie des Mähdreschers war ihre [ancient agriculture's] Produktivität äusserst gering: etwa 80 Prozent aller Menschen mussten unter derartigen Voraussetzungen im Agrarbereich arbeiten, um die Versorgung der gesamten Gesellschaft mit Nahrungsmitteln und anderen Agrarerzeugnissen wie etwa Wolle sicherzustellen.' Cf. Davies (1984) 271 concerning the Hellenistic world: 'In conditions which rarely allowed a ten-fold yield (often much lower), food production will have required the labour of at least 80% of the adult population as a whole, men or women, slave or free.'

2 A figure of about 80% engaged in agriculture remained valid throughout the pre-industrial era. Cf. Allen (2000) 6ff on Europe c. 1800; Ruiz (1998) 55 on early modern Spain and Portugal.

cent; in agriculturally advanced regions it was about one-third.³ In reality, however, the share of agriculture in the division of labour was much higher than that. Early modern Italy shows exactly the same picture. On the one hand, Italian agriculture was characterised by a high level of soil productivity, due partly to the high input of labour, partly to its high technical level. On the other hand, however, the agricultural sector was overmanned, leading to low labour productivity. The 'overmanning' of agriculture was due to the restrictions that the wider economy imposed; part of the solution came in the form of the massive migration at the end of the nineteenth century.⁴ A contrasting example may be provided by Holland, where grain imports from the Baltic created the opportunity for agricultural specialisation, which, together with the widespread employment of seasonal workers from neighbouring regions, increased agricultural labour productivity and thus made labour available for non-agricultural activities.⁵

The situation in the Mediterranean parts of the Roman Empire was probably similar to that of France or Italy. As we shall see, in many parts of the Roman world agriculture was capable of producing on average a surplus that was sufficient to sustain a much larger part of the population than 10 or 20 per cent. In early modern France, two factors played a role in the discrepancy between the percentage of the population that was theoretically needed to sustain the total population and the proportion that was actually engaged in agriculture: first, the inflexibility of the labour market in solving the seasonal pattern of labour demand in agriculture; secondly, the failure of the market to free people from the restraints that bound them to food production. Grantham concluded that while agricultural productivity had expanded significantly, the wider economic development 'did not provide an immediate mechanism for tapping the labour surpluses locked up in rural families'.⁶ This hypothesis forms the background for the next two chapters. In this chapter, we will discuss productivity in farming in the Mediterranean parts of the Roman Empire, in the next the employment of the labour capacity that existed in the smallholders' households.

3 Grantham (1993) 487. Cf. Allen (2000) 1: 'Crop yields have received considerable attention. . . . However, labour productivity is arguably a more important variable in explaining the transition to an urban, industrial economy.'

4 Epstein (1998) 107f. Allen (2000) 6 estimates that in 1800, 74% of the population of Italy was engaged in agriculture, against for instance 51% in England.

5 Van Zanden (1991); De Vries and Van der Woude (1995).

6 Grantham (1993) 496.

MEANS OF PRODUCTION

According to neo-classical economic theory, the three basic means of production in agriculture are capital, land and labour. Neo-classical economics concerns itself with optimisation of one's resources, which in a capitalistic world means in particular the optimisation of the return on capital investment. We shall see later that there is more to economics than this, but even the peasants in Dio Chrysostom's *Euboicus* may unwittingly have employed neo-classical theory when deciding on a fine day to hunt boar rather than work the land. Therefore, neo-classical economic theory offers a good starting point for understanding the role of the means of production in agriculture in the Roman world.

The balance between the input of capital, land and labour can vary, depending on the resources of the farmer. This variation is based on the fact that one production factor can be substituted by another. For example, the farmer who has just a small plot to cultivate can compensate for this by employing much labour on the little land he has. The farmer who lacks labour can buy equipment or animals to do part of the work, if he has the capital to do so. In these two examples, total production can be equal, though arrived at by different means. The term 'productivity' always has to relate to a production factor – by itself, it has no meaning. In the first example, labour productivity will be low, land productivity high. In the second example, labour productivity will be high, due to the input of capital.

The basic economic difference between farming on peasant farms, wealthier market-orientated farms⁷ and large estates consists of the variation in the input of production factors. Small-scale tenants are not easily distinguished from peasants or market-orientated farmers in this regard, because they can, in fact, be either. Likewise, large-scale tenants are essentially similar to estate owners. Tenancy constitutes a means to gain access to production factors. The small-scale tenant gains access to land and indirectly to capital, which is provided by the landlord, while in turn the landlord gains access to labour, management and sometimes also capital by renting out his land.

7 Farms between peasant farms and the estates of large landowners are in the literature on later times commonly designated as 'family farms'. They are typified by the reliance on outside labour and their market orientation. However, since peasants usually rely on the labour within their household, the designation 'family farms' may be confusing. Hence, the phrase 'market-orientated farms' is preferred here, although this is not to say that peasant were not involved in the market.

However, one production factor cannot be substituted by another indefinitely without reducing efficiency. Substitution of production factors means that the productivity of the one, let's say land, is enhanced by the extra input of another, let's say labour. In our example, the farmer can put in many working hours ploughing and weeding the land, transporting and distributing manure, and so forth, thereby producing a good harvest. This will mean that the productivity of the land will be improved. However, this is at the cost of the extra input of labour. If the farmer were to put in only half the working hours ploughing, weeding and manuring the land, his harvest would be diminished, but not halved. The productivity of the land would be lower, but labour productivity would be higher. The labour requirements of different types of farming and of different crops vary: a field of vegetables or flax, for instance, requires more labour than an equal field of cereals. Cattle or sheep farming, on the other hand, is labour-extensive. Therefore, the opposite strategy to the one in our example is also possible: a farmer who has large tracts of land can decide to work it extensively, i.e. putting little labour into it, for instance by using it to herd cattle or sheep. However, beyond a certain point, there would be little point in increasing the amount of land without the input of additional herdsman and livestock. In general, each additional unit of input will tend to result in less and less extra output. Neo-classical economic theory expresses this as the law of diminishing marginal returns. Amongst other things, this law can determine that sometimes it is better to hunt boar than to work the land.

Capital

The law of diminishing marginal returns determines the efficiency of a particular balance of input factors in a farming unit. Among the various means of production, capital is crucial, since it allows adjustment of the balance between the various production factors: capital buys or rents land, it buys slaves, animals, seed, equipment, and so forth, and it hires labour. Furthermore, capital is required for innovation. For instance, given a particular type of soil, market situation and set of resources, it might be more lucrative to grow vines or olives than cereals. However, one needs capital for the investment in plants and equipment – and for the means of subsistence during the time it takes for these plants to become productive. Farmers who lack capital lack the means for flexibility and innovation.

By their nature, peasant households had little capital at their disposal. They might have had some financial reserves, to be used after a bad

harvest or to provide for a dowry. However, there was not much scope for capital investment beyond a little money to buy a mule or to rent a small plot of land. In contrast, market-orientated farmers used external labour, worked for the market, and thus were more capital-orientated. As we shall see, the more wealthy among them probably had recourse to sufficient capital to control, though on a relatively small scale, the input of production factors by renting a farm as tenants, buying slaves or oxen, or hiring wage-labour. It is important to keep in mind, though, that market-orientated farmers, who had some money to spend, might not have been eager to invest their capital in expensive equipment or land improvements, since the buying or renting of more land was a much more straightforward and less risky way of expanding their farm. In other words, without further inducement in the form of, for instance, high land prices and/or large and dependable markets nearby, the step towards more capital-intensive farming (rather than more of the same kind of farming) was not readily made.

However, did peasants have the opportunity to borrow the money they needed for investment? One economist recently pointed out that 'the similarity between the rate of interest on the Roman agricultural foundations and the rate for monetary loans suggests strongly that there was a capital market in Rome.'⁸ Indeed, numerous examples in the sources attest that capital was an asset freely used by the Roman elite. Among themselves, they regularly borrowed and lent out money, and sometimes, though not always, they borrowed money for such productive purposes as agricultural investment.⁹ Pliny's explanation of how to finance the purchase of an estate adjoining the one he already owned at Tifernum Tiberinum for the sum of 3 million sesterces is revealing:

It is true, indeed, my estate is chiefly in land, but I have some money placed out at interest, and I can borrow without difficulty. I have always a sure resource in the purse of my wife's mother, which I can use with the same freedom as my own.¹⁰

However, it may be doubted whether the peasantry could obtain much credit for investment from wealthy landowners like Pliny, since it would be considered far too insecure a loan. There are examples of loans on a

8 Temin (2001) 175. In contrast, Millett (2001) 24 denies the existence of much of a capital market in the ancient world.

9 Cf. Finley (1985) 141. On credit in general, Andreau (1999) 12ff.

10 Pliny, *Ep.* 3.19.8. Duncan-Jones (1982) 20f; Finley (1985) 142, 197f; Kehoe (1997) 46ff.

smaller scale, but the sums involved are still substantial.¹¹ Furthermore, peasants relied on outside credit only under the most pressing circumstances. In early modern Italy, credit could only be obtained by wealthier farmers, who had sufficient collateral.¹² Modern Mozambique offers a clarifying parallel: 'While agricultural credit needs in the aggregate might be substantial, the credit needs of each individual farmer are small.' Because of the large number of small transactions, the costs of gathering sufficient information to diminish the risks involved in peasant loans were too high.¹³ One form of credit that we do see in the ancient sources, in particular in Palestine and Egypt, avoided this problem partly by extending a loan of money against the next harvest. However, such loans primarily served to spread the smallholders' annual income and did not increase their income in the long run. On the contrary, owing to the short periods covered by these loans and the high rates of interest, they offered little investment capital to poor peasants.¹⁴ In short, peasants were not participants in the capital market.¹⁵

What about the widespread occurrence of debt among the rural poor, one might object. Is this not indicated, for instance, by the regular mention of 'debt-bondsmen' in our sources? Varro distinguishes three types of free labour in agriculture: one's family, wage-labour 'and those whom our people called debt-bondsmen (*obaerarii*), and of whom there are still many in Asia, in Egypt and in Illyricum'. Also Columella mentions 'citizens enslaved for debt'.¹⁶ However, we should be careful to distinguish between widespread indebtedness of peasants (or tenants) and access to capital in the form of credit. Undoubtedly, most smallholders fell into debt due to personal crises, when they had to borrow money or seed-corn in order to survive, or they fell behind in the payment of rent or taxes.¹⁷ They may have preferred to take loans in money or kind from relatives and neighbours.¹⁸ However, such community help did not always suffice – as the widespread demand for abolition of debts at some periods shows.¹⁹ Widespread indebtedness among smallholders is no indication of

11 Temin (2001) 174f. 12 Epstein (1998) 100.

13 Arndt, Schiller and Tarp (2001).

14 On the advance sale of crops, see also chapter three.

15 Thus also Osborne (1987) 93 regarding Classical Greece.

16 Varro 1.17.2; Columella 1.3.12. See also Sallust, *Cat.* 33.1. Cf. De Neeve (1984) 66ff; Finley (1985) 66ff; Garnsey and Saller (1987) 111; Gallant (1991) 185ff; Scheidel (1992) 348; (1994b) 47, 183ff.

17 Regarding early modern Europe, Watts (1984) 125.

18 For example Dio Chrys., *Or.* 7.68f. Cf. the loan of seed-corn in Egypt: P.Oxy. 7.1031; P.Col. 7.176 = Rowlandson (1998) 178.

19 See for instance the story in Livy (2.23.5–6) of a veteran who came into debt-bondage through a series of misfortunes: destruction of his fields and farm by the enemy, theft of his livestock,

their significant participation in the capital market. It rather points to their lack of financial resilience. We may safely conclude that for most of the peasantry, available capital was fixed at a low level.

Land

The size of a farm is not only determined by its acreage, although the distinction between farm size and acreage is seldom made in the literature on the ancient world. Besides plot size, also labour and capital invested in a farm determine its size as an agricultural enterprise. A labour- and capital-intensive farm cultivating a high-value cash crop for the market (such as flowers or grapes near a city like Rome) obviously has to count as larger than a subsistence farm of equal acreage. Hence, plot size in itself does not determine whether a farm can sustain a household of a particular size. Nevertheless, plot size is important, because it determines how much land there is available to invest capital in and to employ labour on.

At the upper end of the scale, there seems to be no limit to the amount of land that could be owned by the extremely rich, although this does not mean that their land was actually employed as one agricultural unit.²⁰ In our Latin sources, an estate that operates as an agricultural unit is called a *fundus*. For instance, one wealthy family mentioned by Cicero, though not exorbitantly rich, owned thirteen *fundi* in one region.²¹ An illustration of the dispersal of private landholdings in first-century Egypt is offered by the evidence concerning the imperial domains in the Arsinoite nome. Although much of the evidence is of later date, it tells us who the owners of the various estates were before they came into the emperor's hands. We can say little about the size of these holdings, many of which were owned by members of the Julio-Claudian family or prominent citizens or freedmen of that time, but it is clear that the estates were dispersed over several villages. Seneca, for instance, whose possessions in Egypt at the time of his death were exceeded only by Nero's, owned land in twelve villages in the

taxation and usurious interest. On abolition of debt in early Rome, see recently Cornell (1995) 266ff, 330ff, who plausibly proposes that the main function for debt-bondage was to offer (dependent) labour to large landowners.

20 See Scramuzza (1959) 320f; Duncan-Jones (1982) 323ff; Garnsey and Saller (1987) 66ff; Garnsey (2002) 696ff.

21 Cicero, *Sex. Rosc.* 7.20. On the size of *fundi* and the dispersal of holdings, Finley (1985) 112; Garnsey and Saller (1987) 69ff; Mratschek-Halfmann (1993) 95ff. On the meaning of *fundus* in legal sources, Buck (1983) 12f.

Arsinoite nome.²² A farm of truly large scale is attested in Africa, where a *conductor* leased a *fundus* of 1,600ha.²³ Cato, in contrast, gives us the figure of 240 *iugera* (60ha) for an olive plantation.²⁴ Farms of such size are typical villas, which were owned by wealthy landowners and were beyond the means of any smallholder.

It seems that, at least regionally, there was a substantial class of well-to-do farmers, whose means were below those of the villa-owners, but beyond that of a peasant. Cicero refers to such farmers regarding first-century BC Sicily:

... what of the farmers who have but a single yoke of oxen, and toil unceasingly with their own hands – and to this class, before you became a governor, a great number and a large proportion of the Sicilians belonged.²⁵

This class of landowners belonged neither to the peasantry nor to the elite. Cicero's remarks concerning their demise under Verres' rule and the personal toil of these proprietors are plain rhetoric, intended to emphasise the abuse of these hard-working farmers by the ruthless governor.²⁶ Elsewhere, Cicero mentions one Polemarchus, who exploited 50 *iugera* (12.5ha) of grain land, which may point to a substantial farm, but hardly makes him a large landowner.²⁷

Farmers employing a yoke of oxen belonged to the more wealthy side of the spectrum of smallholders. In this regard, Varro transmits an interesting figure, provided by Saserna, who wrote that two yokes of oxen were sufficient for 200 *iugera* (50ha) of arable land.²⁸ Oxen are an indivisible investment (like tractors): if you do not have enough land to employ one ox efficiently, there is no option to employ less than one ox. According to Saserna's estimate, less arable than 100 *iugera* (25ha) would

22 For the dispersal of imperial land previously owned by Seneca and others, see Parassoglou (1978) 34f. On the origins of the imperial domains in Egypt, *ibid.* pp. 15ff.

23 Pleket (1990) 94.

24 Cato, *de agri cult.* 12: an olive plantation of 240 *iugera* (60ha); and 13: a vineyard of 100 *iugera* (25ha). See Duncan-Jones (1982) 325f.

25 Cicero, 2 *Verr.* 3.27. According to Scramuzza (1959) 318, the passage refers to poor peasants with 3 or 4 *iugera*, which is absurd.

26 Cf. Cicero, *pro Scauro* 25. In particular, Wilson (2000) 134ff, 157ff.

27 Cicero, 2 *Verr.* 3.56.

28 Varro 1.19.1; Columella 2.12.7. However, Pliny, *Hist. nat.* 18.173, estimates 40 *iugera* (10ha) of light soil and 30 *iugera* (7.5ha) of heavy soil for a pair of oxen. Saserna's figure for arable is more relevant to peasant farming than Cato's estimate of 3 pair of oxen for an olive plantation of 240 *iugera* (Cato, *de agri cult.* 12.1). Halstead (1987) 84 states that 5ha of land would be needed if work animals had to be fed in addition to a family. However, 5ha would be insufficient to employ a pair of oxen. (n. 49 cites a study that states 10ha as the maximum [!] cultivable area for smallholders with a pair of oxen. That surely must be wrong.) See also Duncan-Jones (1982) 330.

imply inefficient use of a yoke of oxen.²⁹ Oxen are expensive in upkeep and require a substantial farm to be used profitably.³⁰ Therefore, most smallholders did not own a yoke of oxen (or even one ox).³¹ This is not to say that they could not employ oxen. A legal source mentions the lending out of oxen to neighbours.³² The hiring out of oxen may also have been quite common.³³ However, mules, asses and even cows were alternatives to oxen, more appropriate for the means and the needs of peasant farmers.³⁴ Although we cannot be precise about their landholdings, we can be sure that Cicero's Sicilian farmers – and other oxen-owning farmers as well – held considerably more land than the average peasant.

The only figures we have for plot sizes at the lower end of the scale are those relating to the size of allotments in colonies and in *virittane* distribution. The figures for tiny plots in early Rome may be brushed aside as unhistorical and untrustworthy. However, the figures for allotments during the second century BC cannot be so easily dismissed, and even here figures of three, five, six *iugera*, and so forth, are mentioned (0.75 to 1.5ha). Scholars have often expressed their astonishment at such small plots given to colonists. Such farms can only have sustained a household when their holders had access to other means of survival, such as pasturage, fishing, livestock and wage-labour.³⁵ It must be said that some of the allotments in the early second century BC were not very successful: some colonies were abandoned within a few years of their establishment.³⁶ Larger figures of land allocated to colonists are given as well: 10, 15, 20, 30 and even 50 *iugera* (2.5 to 12.5ha), the latter corresponding to the size of the farms mentioned by Cicero regarding Sicily in the early first century BC. Moreover, higher-ranking soldiers and cavalrymen received larger

29 Northern European estimates are of no use regarding the Mediterranean world, where soils are usually much lighter. Thus, Langton (1998) 384.

30 Accordingly, Celsus (quoted by Columella 2.2.24) advised the use of smaller oxen, which cost less money. See also Lirb (1993) 290ff contra Jongman (1988). Regarding Classical Greece, see Hodkinson (1988) 39; Sallares (1991) 312; Gallant (1991) 124f; Isager and Skydsgaard (1992) 86ff. Egypt: Rowlandson (1996) 23.

31 Medieval Macedonia may provide an interesting parallel: of the 130 tenant-households of the village of Gomatou in 1300–1, 86 owned no oxen at all; 18 owned one ox each; 24 had two oxen each; and 4 had three oxen each. Since the really poor were the households with no access to land at all, the tenant-households with no oxen were not necessarily poor. However, the same village hardly owned any horses or mules. Laiou (1977) 67. Cf. Pelizzon (2000) 100f.

32 *Instit.* 3.24.2. Sharing of oxen also in Laiou (1977) 62; Lirb (1993) 293f.

33 Ruiz (1998) 66 regarding early modern Spain.

34 See also Phillips (1979) 43; Casey (1985) 216; Spurr (1986) 30ff; Halstead and Jones (1989) 48f.

35 For discussion and references, see Garnsey (1976) 228f; Frayn (1979) 91ff; Evans (1980) 136, 161; Garnsey (1980b) 37; Garnsey (1988) 46; Pleket (1990) 88f.

36 Erdkamp (1998) 293.

plots, up to 140 *iugera* (35ha) in the case of cavalrymen. Although it is impossible to say how many of these allotments became long-lived farms, it is clear that allotments of more than 10ha provided at least the opportunity for a class of well-to-do farmers to emerge. Also interesting is the distribution of land in the *ager Campanus* by Caesar in 59 BC. Caesar gave plots of ten *iugera* (2.5ha) to poor families with three children or more among the population of the city of Rome. Since the purpose of this measure seems to have been to give as many as possible of the urban poor a means of subsistence, it is likely that these allotments reflect farms at the low end of the scale, but nevertheless sufficient for poor households to survive.³⁷

The evidence on Italy may be compared to that from Roman Egypt, although the latter is generally from a much later date. A tax list of holdings of at least 57 individual owners from the village of Theadelphia (AD 164/5) contains only three cases of more than ten *aroura* (= c. 2.8ha). However, these farmers may have owned or leased land that was not on the list.³⁸ Another list of landholdings pertains to the Arsinoite village of Philadelphia and was compiled in AD 216/17 in connection with the provisioning of Roman armies campaigning in Syria. The list distinguishes between grain land and orchard land, but only contains private land. The average holding of grain land was 17.49 *aroura* (4.8ha), but 67 of the 201 individuals listed owned land in both categories.³⁹ Orchard land in Philadelphia seems concentrated in fewer hands, although many smallholders owned small plots. There were few individuals on the list whose holdings of grain land were considerably above average. Thus, the Philadelphia list may confirm the observation that there was a 'broad middle range of landholders' in Roman Egypt.⁴⁰ The farmers on the list may have owned land in neighbouring villages or may have leased private land, but, in contrast to wealthy landowners, it seems unlikely that many smallholders held additional private land on a substantial scale.

More worrying is the possibility that smallholders in Philadelphia held public land in addition to private land, since the region of Philadelphia seems to have included much public land.⁴¹ However, a third register, listing the holdings of public and private grain land of villagers in Karanis in the early fourth century AD, paints a picture that is not unlike that of Philadelphia. Of the 106 individuals, 71 held between 10 *aroura*. (2.7ha) and 50 *aroura*. (13.5ha) of grain land. Fourteen held less land, 21 more.⁴²

37 Cf. Evans (1981) 431ff; Finley (1985) 105.

39 P.Yale inv. 296. Sharp (1998) 30ff.

40 Sharp (1999a) 170f.

38 BGU IX 1896. Sharp (1999a) 170f.

41 Sharp (1998) 50.

42 P.Cair.Isid. 9. Sharp (1998) 34.

On the basis of this evidence, Roger Bagnall has concluded that 'there was a broad middle ground among the villagers.' He furthermore assumed on the basis of some adjustments and calculations that 59 per cent of villagers' holdings were above the minimum subsistence requirement, which he estimates to have been 10 *aroura*.⁴³ It seems possible to conclude that in Middle Egypt the majority of smallholders held between 2.5 and 15ha of grain land and that some also held a few hectares of orchard land.

The evidence on the smallholders' access to land and the plot size among the peasantry is very limited. The few figures we have all pertain to Italy or Egypt. When comparing holdings of farmers in Egypt and other Mediterranean lands, one has to keep in mind the differences in soil and seed productivity and in labour and capital investment. We can only presume that the situation in other parts of the Mediterranean world was similar. It is estimated that the 'average' plot in Roman Palestine was 7ha, which seems quite a lot.⁴⁴ Four to six hectares are mentioned regarding Classical Greece.⁴⁵ Outside Egypt, it is simply impossible to attach proportions of smallholders to the plot sizes our sources mention. We do not know what the size of a 'typical' peasant farm was, or how many farmers there were who cultivated farms of more than 10ha. In medieval central Italy, for instance, wealthy, mixed family farms typically had a size of 10–30ha.⁴⁶ However, the little quantitative evidence and the general picture emerging from the sources show that in some regions wealthy farmers existed who worked on substantial farms, while many peasants had to make do with very small farms of 2.5ha and less. Poor peasants did not have the means to buy or rent additional land.

43 Bagnall (1992) 135 (quote); 138.

44 Ben-David (1974) 44ff.

45 In his study of survival strategies in ancient Greece, Gallant (1991) 82ff concludes that subsistence production of peasant households required three to four ha, which seems to offer some confirmation of the figures above. Four to six ha Gallant regards as 'normative' for a peasant household. However, this estimate should be taken with a pinch of salt. (This estimate is accepted unquestioningly by De Angelis [2000] 118, who uses it to calculate the number of people that could be sustained by the agricultural land of Greek Sicily.) Gallant's conclusion is based on an estimation of caloric consumption in average households and figures from the first half of the twentieth century concerning soil productivity. He points out that between 15 and 25% of households in modern Mediterranean countries cultivated 3–5ha, but that approximately half cultivated even less land. However, not all of these households can be seen as peasants, since many of them may primarily have been households of artisans or wage-labourers, who worked a small plot on the side. Moreover, soil productivity is indissolubly connected to labour input. It is not a fixed variable, and projecting twentieth-century figures onto the ancient world only offers false confidence.

46 Epstein (1998) 91.

TENANCY: CAPITAL, LAND AND LABOUR

Regarding capital and land, matters were more complex in tenancy farming. First, however, one should realise that the term 'tenant' – like its Latin equivalent *colonus* – covers a wide spectrum from wealthy men investing their capital in agriculture to poor cultivators of the soil.⁴⁷ Cicero, for instance, calls the tenant of an estate in Sicily, which was rented for HS 6,000 annually, *homo inlustris ac nobilis*.⁴⁸ Columella may also have had such wealthy men in mind, when he wrote that urban absentee-tenants, who left slaves in charge of their rented farms, were among the worst kind.⁴⁹ Such tenants were like landowners in that they used their capital to acquire land, but they preferred to lease rather than to buy, though they may very well have been landowners at the same time. As far as tenants were concerned, Columella favoured 'real farmers', who lived on their rented farms and thus supervised the farm operations closely. These farms could still be worked with slave labour, as the example shows of the tenants on an estate at Tifernum Tiberinum that Pliny considered buying. The tenants who occupied the farms on this estate had been in such debt that the previous owner had seized their property, including slaves. It was not the 3 million sesterces needed to buy the estate that made Pliny hesitate most, but rather the required investment of buying new slaves to equip the farms. Moreover, Pliny intended to buy trustworthy workers, not chattel-slaves, whom nobody in the region employed.⁵⁰ The tenants on the estate may have been indebted, but they did not belong to the category of poor peasants.⁵¹ While it is likely that these tenants depended for their livelihood on the farms they rented,⁵² the outlay of capital on their farms suggests that they operated beyond mere subsistence. It must be said, though, that the majority of tenants in the Roman world were probably poor peasants, who operated their rented farms just like poor freeholders.

On the basis of studies of the modern Third World, Lin Foxhall has observed that 'the productivity on plots cultivated by tenants or

47 See in general, Kehoe (1997) 174ff.

48 Cicero, 2 *Verr.* 3.93. Cf. Pliny, *Ep.* 7.18.2–3 (an annual rent of HS 30,000); CIL VI 33840 (HS 26,000 for several *horti* near Rome); *Digest* 32.27.2.

49 Columella 1.7.3–4. Cf. Scheidel (1994b) 109ff.

50 Pliny, *Ep.* 3.19.

51 De Neeve (1990) 387: Pliny's tenants 'were not typical peasants, but substantial farmers'. Also, Scheidel (1994b) 66. However, Kehoe (1989) 580 treats Pliny's tenants as if they were poor peasants. Likewise, Pleket (1990) 58 ('einheitliche, farblose Gestalten'), 93 ('ein recht elendes, schwungloses Leben').

52 Thus, Kehoe (1997) 174.

sharecroppers is higher than on similar plots cultivated by wage labourers or even owner-occupiers.' She largely ascribes the high productivity of tenants to the 'whip of hunger': the obligation to pay rent forces tenants to work harder.⁵³ Undoubtedly, this may be one element of the explanation. More important, however, is the sharing of input factors between both parties. Tenancy – including sharecropping – generally combines a relatively high input of labour with a high input of capital. In comparison, peasants lack the capital to invest in their land. Landowners tend to economise on the input of labour if that is proportionally related to the cost of labour. Hired or servile labour costs money in the form of wage or purchase price, and thus landowners limit the input of labour in accordance with the law of marginal profits. Thus, the productivity of tenancy is directly related to the allocation of the investment of land, capital and labour.

The tenants who were sufficiently wealthy to rent well-equipped farms such as those on Pliny's estate cannot be regarded as poor, but it was by means of the tenancy contract with the landowner that they gained access to most of the capital needed to exploit such farms. According to B.W. Frier's interpretation of the principal text on the duties of landlord and tenant in equipping tenant farms (Ulpianus *Dig.* 19.2.19.2), 'the landlord supplied all the durable equipment which the tenant did not already have; while the tenant both supplied the ephemeral equipment . . . and readied all the equipment for its immediate use'.⁵⁴ In other words, the landlord provided a farm that was ready for production, while the tenant bore the cost of exploitation. A well-equipped farm was a considerable investment on the part of the landlord. However, the obligations of the tenant implied that he had to exploit the farm in such a way as to maintain its productivity.⁵⁵ This means that tenants had to have substantial means – such as slaves and animals for labour and manure – to cultivate the land properly.⁵⁶ This is also shown by one of Pliny's letters mentioning the difficulties that he experienced in finding 'proper tenants'. This phrase primarily means tenants who were sufficiently wealthy to contribute sufficient means in exploiting their farm.⁵⁷

The above-mentioned text from the *Digest* discusses the equipping of farms that specialise in the production of olive oil and wine. The cultivation of these crops required more investment in equipment and labour than

⁵³ Foxhall (1990) 102.

⁵⁴ Frier (1979) 209. Cf. recently, Kehoe (1997) 181ff.

⁵⁵ *Digest* 19.2.25.3.

⁵⁶ Thus Kehoe (1988) 29ff; (1989) 559.

⁵⁷ Pliny, *Ep.* 7.30.3. Thus, Frier (1989–90) 263; De Neeve (1990) 386f; Scheidel (1992) 361.

cereal farming. Such capital-intensive types of farming were probably not an attractive option to freeholding peasants, who lacked the means to participate in the market-orientated production of wine and olive oil.⁵⁸ Lin Foxhall has pointed out that, besides land, tenancy may also have offered farmers access to seed, water and animal labour.⁵⁹ Tenancy offered a means to gain access to capital. Part of this capital was provided by landowners, who offered land and permanent equipment, and who, in return, gained access to the management, labour and capital that was invested by their tenants.⁶⁰

Regarding the provisioning of seed-corn to tenants in Egypt, two different systems seem to have operated. Michael Sharp points to many leases from the Arsinoite nome that stipulate the repayment as part of the rent of an advance of seed provided by the landlord. The cases he mentions date from the late first century BC to the early third century AD.⁶¹ At the same time, Jane Rowlandson points out that during the early Empire, unlike the Ptolemaic period, tenants had to provide seed-corn themselves, which she interprets as an indication of their financial strength, since it is implied that the tenants possessed sufficient reserves to supply their own seed. In Oxyrhynchus, tenancy contracts were usually for four years, during which the tenants supplied their own seed-corn and equipment.⁶² The picture that emerges is not unlike that of Pliny's estates. Rowlandson notes that the sharecropping contracts in early Roman Egypt seem to imply a degree of equality between tenant and landlord. Unlike other types of tenancy contracts, they were expressed in terms of a partnership. For instance, the tenant agreed to hand over a proportion of the crop, instead of paying a rent. Rather than poor and dependent peasants, these were independent farmers. Thus, the wealthier tenants in early Roman Egypt also contributed capital and management to the exploitation of the landlord's land.⁶³

Landowners also provided capital in the form of credit. Indebtedness amongst tenants seems to have been endemic.⁶⁴ Pliny's tenants who were behind in paying their rents are an important case in point. The previous

58 Cf. Alcock (1993) 81ff; Kehoe (1997) 198ff. On the capital investment in the cultivation of vines in Roman Egypt, Rowlandson (1996) 228.

59 Foxhall (1990) 107.

60 Scheidel (1993) makes clear that the few instances in the sources of slaves that are engaged as tenants should be interpreted as a managerial form rather than as an instance of replacement of free by servile tenants.

61 Sharp (1998) 70.

62 Rowlandson (1999) 145.

63 Rowlandson (1996) 213ff (esp. 214, 224), 276.

64 See for instance Pliny, *Ep.* 10.8.5; CIL XI 114, col. VI, 72 = Freis nr. 70; *Digest* 33.7.20.1, 3.

owner had confiscated their possessions, but Pliny realised that this was not in a landlord's long-term interest. The fact that Pliny considers buying slaves to work on the tenants' farms shows that tenants gained access to capital through their landlord even beyond the latter's contractual obligations.⁶⁵ Tenants were thus better off regarding credit than their freeholding colleagues. Freeholding peasants who had had to borrow money in order to survive a personal crisis were more readily forced to sell property than tenants. By extending their credit, a landlord would preserve his tenants' means of production and he would thus retain their profitability in the long term. Investment-credit and subsistence-credit are thus not always easily distinguished. Columella not only preferred tenants who were resident on the farm, but he also favoured permanency. Therefore, he wrote, a landowner should be kind to his tenants:

He should be civil in dealing with his tenants, should show himself affable, and should be more exacting in the matter of work than of payments, as this gives less offence yet is, generally speaking, more profitable.⁶⁶

Kehoe observes that 'Columella envisioned tenants as contributing to the landlord's welfare by continually investing labour and capital to improve their own farms.'⁶⁷ There was a downside to the ease with which tenants could build up debts with their landlord, and this made it even more worthwhile for the latter to give respite to his tenants: debt meant dependency. Landlords could easily convert postponement of rent or the loan of seed-corn into added obligations and an increased hold on their tenants.⁶⁸ However, the fact remains that tenants generally gained access to capital and credit more easily than small-scale freeholders did.

Sharecropping: Pliny, Epist. 9.37

Tenancy is a way of allocating the investment of capital, land and labour. The most common type of tenancy in Roman law, and also the one that was practised on Pliny's estates and the estate that he considered buying at

65 According to Frier (1979) 217, during the first century AD, slaves were normally supplied by the tenants. Cf. Kehoe (1988) 17f. De Neeve (1990) 385f, rightly points out that originally the tenants on the estate that Pliny considered to buy had supplied the slaves, 'witness the fact that they were among the tenants' pignora'.

66 Columella 1.7.1. See also Scheidel (1994b) 54ff; Kehoe (1988) 31f; Rosafio (1994) 148f; Kehoe (1997) 196f.

67 Kehoe (1988) 32.

68 Regarding antiquity: Kehoe (1988) 38; Foxhall (1990) 101ff; Hamel (1990) 135. French landlords made good use of remittance of debts to increase the debtor's obligations. Hufton (1985) 114. See also McArdle (1978) 110f, 126; Ellis (1988) 151.

Tifernum Tiberinum, was characterised by the payment of monetary rents and by short-term lease contracts, although, as we have seen, short leases did not preclude a large degree of continuity. However, in a letter from AD 107, Pliny mentions another type of tenancy, when describing the difficulties he experienced with the tenants on his estates and the solution he found in dealing with these problems. Pliny's considerations concerning the introduction of a different type of tenancy shed light not only on this new kind of lease, but also on the economic functioning of the 'classic' leasehold. Pliny begins this important letter, which is worth quoting almost in full, by excusing himself for not being able to attend the addressee's first day in office,

especially as I am detained here by the necessity of organising my farms for the coming years. I am obliged to enter entirely upon a new method with my tenants: for during the last five years, though I made them very considerable abatements, they have run greatly in arrears. For this reason several of them not only take no sort of care to lessen a debt, which they despaired of paying in full, but even seize and consume all the produce of the lands, in the belief that it would now be no advantage to themselves to spare it.

I must therefore obviate this increasing evil, and endeavour to find out some remedy against it. The only one I can think of is not to let at a money-rent, but on condition of receiving a fixed share of the produce, and then to appoint some of my servants as overseers to keep a watch on the harvest.⁶⁹

Pliny's letter shows that the risks involved in agriculture, which caused the indebtedness of tenants, at some point affected the profitability of the system. Remission of rents had failed as a solution to the problem, since debts had increased all the same during the past *lustrum*, i.e. during the five years of the past term of contract. Already in AD 98–9, Pliny had complained about poor crops, which forced him to consider remission of rent.⁷⁰ Moreover, some tenants failed to adhere to their part of the bargain, because they had begun to exploit their farm in a way that impaired its long-term productivity.⁷¹ The shortage of sufficiently wealthy tenants and the failure of the remission of rents induced Pliny to change the system of tenancy on his estates by introducing sharecropping.⁷²

69 Pliny, *Ep.* 9.37.

70 Pliny, *Ep.* 10.8.5. Cf. De Neeve (1990) 389. According to Scheidel (1992) 360, Pliny refers to 'Grosspacht' here.

71 Cf. Kehoe (1988) 39.

72 Difficulties in finding suitable tenants are mentioned in 7.30.3. Cf. Kehoe (1988) 35f; De Neeve (1990) 386f.

Sharecropping basically involved the concession on the part of a landlord to accept a larger share of the risks involved in agriculture in return for more security regarding the long-term productive exploitation of his estates. In sharecropping, tenants paid a fixed part of the farm's produce, regardless of the size of the harvest.⁷³ Payment of rent in kind protected the tenants from the vagaries of the market. The risk of harvest failure is shared by landlord and tenant alike, which is also recognised as its main distinction from the 'classic' type of tenancy in the only legal source we have on sharecropping in the Roman world:

Higher force, which the Greeks term 'the force of god', should not be a source of loss to the lessee if his crops are damaged more than is bearable. On the other hand, if the tenant farmer does not lose his considerable profit, he should bear with equanimity a slight loss. Clearly, I am speaking about a tenant farmer who hires for a fixed sum of money. On the other hand, a sharecropper bears both profit and loss in common with the farm's owner, much like the law in partnership.⁷⁴

As is mentioned in the above passage from the *Digest*, the classic leasehold offered reduction of risk by means of the *remissio mercedis*, which gave the tenant remission of rent under some conditions.⁷⁵ According to Roman law, the landlord had to bear the risk of damage resulting from *vis cui resisti non potest*, such as a flood. Unlike the case of sharecropping, however, the tenant was still subjected to the usual risks of agriculture, such as bad weather, resulting in a bad harvest. In addition, a landlord could offer remission of rent when there was no legal obligation to do so. However, the jurists ruled that bad harvests were compensated by good harvests not only in subsequent, but also in preceding years. Remission of rent could only be claimed by tenants during a run of bad harvests. *Remissio mercedis* in effect had been known since the late Republic and, as the above letter shows, had been applied by Pliny.⁷⁶ Pliny's main alteration in introducing sharecropping was to accept a larger share of the risk than he had done before. By reducing the losses on the part of the tenant when harvests failed, he preserved their means to work their

73 On sharecropping, see Ellis (1988) 141ff; Kehoe (1988) 155ff.

74 Gaius *Digest* 19.2.25.6.

75 On *remissio mercedis*, I follow closely De Neeve (1983) and Frier (1989–90). Frier's disagreement (241ff) with some of De Neeve's proposals is not relevant to my argument. See also Kehoe (1988) 36ff; Kehoe (1997) 142f, 221ff.

76 De Neeve (1983) 323f. Also, De Neeve (1990) 384. Cf. Frier (1989–90) 245. Frier (p. 259) concludes that 'the equitable principle that years of barrenness may be offset by years of plenty' originated in the late Classical period, while De Neeve argues that it already existed earlier.

leasehold in such a way as to ensure its long-term profitability.⁷⁷ His letter plainly states that this was the main objective of the changes he introduced.

There is no reason to conclude with De Neeve that the change in the system of leasing meant 'a social and economic downgrading for the *coloni* concerned'.⁷⁸ Pliny still relied for the profitable exploitation of his estates on the investment of adequate means by his tenants. The allocation of risk was changed in favour of the tenants, but to the mutual advantage of tenants and landlord alike. Pliny readily accepted this risk, since it was in his interest to preserve the long-term income that his estates provided. The allocation of the investment of land, capital and labour seems not to have been significantly altered by Pliny's introduction of sharecropping.

Sharecropping was very suitable for the exploitation of capital-intensive farms. However, De Neeve assumes that sharecropping was most appropriate in a context of capital-extensive arable farming, contributing to the notion that the introduction of sharecropping by Pliny implied a change towards humble, cereal-farming peasants.⁷⁹ De Neeve's equalisation of sharecropping and capital-extensive arable farming may be seen in relation to his hypothesis that the slave-based villa functioned as a 'plantation' that specialised in olives or vines.⁸⁰ It may be interesting to note that in early modern Europe, sharecropping 'was prevalent in areas of intense commercialization and urbanization, such as Tuscany and Lombardy in northern Italy, where it evidently developed in response to the obvious market opportunities to maximize returns from agricultural output'.⁸¹ Sharecropping was for instance widely used in the market-orientated cultivation of vines in Spain during the nineteenth century.⁸² In addition, Jairus Banaji recently stated that in Egypt in late antiquity, 'wine was invariably sharecropped, by contrast with most other crops'.⁸³ Moreover, in early modern France, landowners replaced 10 or 12 families of 'traditional' tenants by one sharecropping family, who had to hand over half of

77 Cf. Kehoe (1988) 39ff; Frier (1989–90) 263ff.

78 De Neeve (1983) 339; (1990) 392. However, this is not to deny that such a development occurred during the next centuries.

79 De Neeve (1990) 395. Also p. 390: 'share-cropping is economically advantageous if large harvest risks exist and if farmers lack capital.' Cf. Frier (1989–90) 264.

80 Criticised by Scheidel (1994a) 160.

81 Scott (1998) 10.

82 Simpson (1995) 72. See also Braudel (1990) 325, who notes that in France, sharecroppers worked the vineyards of wealthy owners.

83 Banaji (2001) 200. Rowlandson (1996) 210 points out that sharecropping in Egypt increased in late Roman times, whereas fixed rents in kind predominated in the early Roman period.

their production, but who worked the land with three or four oxen.⁸⁴ These examples show that in later societies sharecropping occurred in the context of market-orientated agriculture and that it was not necessarily limited to poor farmers, or to capital-extensive cereal farming.

More importantly, Pliny's case does not seem to support De Neeve's assumption. Pliny's estates mainly produced wine for the market. Undoubtedly, the farms also produced other crops, but wine seems to have been the most important cash crop. The bulk of the land that Pliny owned was leased to tenants.⁸⁵ We will never know which other crops Pliny's tenants produced, but it is likely that vineyards constituted a substantial part of their farms.⁸⁶ Pliny not only sold the harvest of the central part of the estate that he cultivated directly, but he also managed the sale of the produce of his tenants.⁸⁷ Pliny sold this crop to merchants, who bought it before the harvest at a pre-arranged price.⁸⁸ This in itself is an important part of the allocation of capital investment in Roman estates, since the contractor largely took care of the capital investment that was needed to finance the cost of harvesting and marketing the estate's produce.⁸⁹ In the letter concerning the introduction of sharecropping, there is nothing to suggest a change in crops as well.⁹⁰ Such a sweeping change as the abolition of vine cultivation would have been an unattractive prospect, but would in any case not have passed unmentioned. Hence, it is highly probable that before and after the introduction of sharecropping, grapes were the tenants' main produce.

Moreover, the transaction concerning the grape harvest makes clear that in practical terms the introduction of sharecropping was not as drastic a change as it might seem at first sight. As the system had previously operated, the tenants had essentially handed over to Pliny their part of the harvest to sell next to his own. Undoubtedly, he had paid the tenants their part of the earnings, after subtracting rent and, possibly, outstanding debts. After the introduction of sharecropping, he had a right to a fixed part of their harvest. The calculation of the sum he paid to his tenants had changed, but sharecropping in itself would not necessitate a change in the marketing of the harvest.

84 Watts (1984) 125.

85 Kehoe (1988) 17; (1989) 557; De Neeve (1990) 373ff.

86 De Neeve (1990) 381f, points out that the context shows that the tenants in 3.19.7 leased vineyards.

87 There is no definite evidence of this in Pliny's letters, but Kehoe's argumentation (1989) 574ff is convincing.

88 In particular, Pliny, *Ep.* 8.2. Kehoe (1989) 559ff; De Neeve (1990) 376ff.

89 See also, Kehoe (1989) 565.

90 Cf. De Neeve (1984) 166, n. 128.

Furthermore, De Neeve writes that 'until the introduction of sharecropping in 107 (9.37) Pliny's tenants were independent, running their own farm as they saw fit.'⁹¹ Since Pliny could easily end the contract every five years if he disliked the way the tenants exploited their leaseholds, this is not quite true. More importantly, there is no reason to assume that much changed in this regard. It is sometimes emphasised that sharecropping would increase the 'managerial costs',⁹² but Pliny does not seem to think much of the investment in a few supervisors, whose only task, according to Pliny's letter, would be the supervision of the harvest, not any intervention in the cultivation of the farms. We may therefore conclude that the profitability of Pliny's estates was still largely based on capital-intensive vineyards, for which he supplied part of the capital needed for the expensive, durable equipment. However, now that his income depended directly on the harvests his tenants produced, he had even more interest in the proper exploitation of his land, which required tenants who were sufficiently wealthy to bear the burden of their part of the bargain.

The sharecroppers who worked on the estates in North Africa seem to have functioned in a way that was not fundamentally different. The main source on sharecropping in North Africa – a series of decrees and governmental decisions from the second century AD concerning the rights and obligations of *coloni* on imperial estates – sheds some light on the economic functioning of sharecropping on these estates.⁹³ One particular remark in the petition addressed to the emperor in AD 182 shows the difference in social status between Pliny's tenants and the *coloni* on the imperial estates: '... your farmers (*rustici*), who were born and raised on your estates. . .'.⁹⁴ Interestingly, the petition from the tenants on an imperial estate in Lydia, dating to the Severan period, makes the same emotional appeal: 'we shall become fugitives from the imperial estates on which we were born and reared.'⁹⁵ While hardly slaves, these tenants seem

91 De Neeve (1990) 375. Also, De Neeve (1984) 88.

92 Thus, Kehoe (1988) 41; De Neeve (1990) 390.

93 CIL VIII 25943 = Freis nr. 86 = D. Flach (1978) 484f; CIL 10570 = Freis nr. 110 = Flach (1978) 110. Cf. Flach (1982) 427ff; Thompson (1987) 563f; Kehoe (1988); Oersted (1994) 118ff; De Ligt (1998) 219ff.

94 CIL VIII 10570, col. III, 27–30. Freis (1994) nr. 110 even translates: 'Deine Bauern, die auf deinen Gütern als Unfreie geboren und aufgezogen wurden'. Cf. Flach (1978) 492. In contrast, Kehoe (1988) 71ff argues that the *coloni* on the imperial estates were farmers with substantial resources. However, there is little evidence to substantiate his argument.

95 Abbott and Johnson (1926) no. 142 = Freis (1994) no. 136.

more dependent than those who worked the lands of Pliny.⁹⁶ The power of the Roman *procurator*, who is in charge of the imperial estates, and of the *conductores*, who lease their exploitation, over the tenants seems quite large. These tenants seem to have been less market-orientated and less mobile than their counterparts on Pliny's estates. They were engaged in mixed farming, as the stipulations concerning their rent show: one third of the wheat, one third of the barley, one fourth of the beans, one third of the wine, one third of the olive oil and a fixed contribution of honey.⁹⁷ In addition, according to the inscription from AD 182, they had to carry out six days of labour on the central part of the estate: two days of ploughing, two days of harvesting and two days of other kinds of work. Interestingly, such labour-intensive tasks as the processing of wine or olives are missing in this context. The kind of agriculture that seems predominant on these estates did not involve as much capital investment as the exploitation of Pliny's estates. Nevertheless, the above-mentioned decrees were intended to stimulate tenants to use their own resources to cultivate unused lands, which shows that they had sufficient means to undertake the effort profitably. The sharecroppers on the North African estates did not only provide labour. It is unlikely, however, that they contributed as much capital and management to the workings of the imperial estates as the tenants on Pliny's estates did.

This is not to say that all sharecroppers were wealthy farmers. Poor sharecroppers were widely known in early modern Europe. In southern France, northern Italy and many parts of Spain – all 'semiperipheral areas', according to S. Pelizzon – the predominant form of farming was small-scale, cereal-based sharecropping.⁹⁸ We should be careful not to treat sharecropping as a homogeneous type of tenancy. Tenancy constitutes a means of allocating the investment of capital, labour and land. The balance in the input of these means of production is different in various types of agriculture. Therefore, sharecropping in capital-extensive cereal farming should not be confused with sharecropping in market-orientated cultivation of capital-intensive cash crops. The latter was possible at Pliny's estates, in particular at his estate at Tifernum Tiberinum, because they had easy access to the huge market of Rome. These conditions

96 However, according to C. R. Whitaker, the social structure and organisation of the estates in Roman times may have their origin in pre-Roman times, which would make comparison between similar legal categories in various parts of the empire impossible. Whitaker (1978) 355, 358ff; (1980) 82, 89.

97 CIL VIII 10570, col. I, 25–30.

98 Pelizzon (2000) 95f; 98 (Sicily). See also Laiou (1977) 61 (medieval Macedonia).

shaped the kind of tenancy on Pliny's estates as a particular way of managing the investment of capital and labour. At other locations, different circumstances led to different solutions. According to Hamel, the sharecroppers in Roman Palestine were pitiful creatures, who worked the land for a rent of up to 75 or 80 per cent (in which case the landlord provided seed and tools). Their unwritten contracts were short, offering little security, while widespread indebtedness further increased the landlord's control.⁹⁹

Summary

We started this part of the discussion with the proposition that neo-classical theory concerning the means of production provides a useful starting point in analysing small-scale agriculture in the Roman world. Capital, it was said, was a crucial input, because it provided the means to balance the various production factors. Capital provided flexibility and the opportunity for innovation, which are necessary to make optimal use of the land and labour. As far as we can tell, peasant plots were small, often not more than two or three hectares (or even less). Peasants also lacked the financial means to compensate for the little land they had. Credit was not an option to gain access to capital, though debt was common. Above the class of peasants, well-to-do farmers existed, who exploited farms in the range of some 10 to 30ha and whose means were sufficient for them to own and employ slaves and oxen. Probably, these farmers were financially solvent, although that is beyond our sources. By definition, large landowners had much land, and usually the capital to exploit it. Part of their land they cultivated directly, but it is characteristic of agriculture in the Roman world that the rich landowners, despite their wealth, involved external capital in their agricultural enterprises. Two examples we have seen: contractors, who purchased, processed and/or sold the harvest of vine or olives, and tenants. The tenants on Pliny's estates provided not only labour but also capital to exploit their capital-intensive leaseholds. In turn, tenants gained access to the landlord's capital (including credit) and land. In capital-extensive agriculture, such as the imperial estates of North Africa, tenants primarily offered labour as their share of the bargain. Tenants, including sharecroppers, covered the whole spectrum from well-to-do farmers to poor peasants.

99 Hamel (1990) 154ff.

YIELD, PRODUCTIVITY AND AGRICULTURAL SURPLUS

The exchange of food between food-producing and non-food-producing sectors – whether by household exchange, free market channels or by coercion – depends on the ability of agriculture to produce a surplus. The scale of the exchange of food is thus first determined by the size of the surplus. Agricultural surplus may be defined as total harvest minus seed and minus consumption by agricultural workers and farm animals. In other words, it is that part of total production which is not required to continue production. Three input factors are of importance in cereal farming: land, labour and seed. Continued production requires some form of soil recovery, by fallowing, manuring or crop rotation. However, soil recovery determined surplus indirectly, as an important factor of labour and seed productivity. Since surplus is total harvest minus seed and minus consumption by human and animal labour, the factors that determine surplus production directly are productivity of seed and of labour.

Yields according to Cicero, Varro and Columella

It has often been assumed that arable farming in antiquity was primitive, and that yields were therefore low. For instance, in his study of the Bagradas Valley in Roman North Africa, Dennis Kehoe used medieval comparisons to substantiate Columella's low figure of 4:1, leading him to assume excessively low levels of productivity in Roman Africa.¹⁰⁰ Likewise, R. Sallares argued on the basis of Columella and medieval parallels that yields in Greece were in the range of 3:1 to 5:1.¹⁰¹ He also pointed out that seed–yield ratios are of little value in estimating agricultural productivity, since, if the plant density is low, a high yield may be obtained at the cost of low soil productivity – and vice versa. Incredibly high yields that are sometimes mentioned in the ancient sources, such as 100:1, may reflect exceptional growing conditions of individual plants. According to Sallares, only soil productivity is important.¹⁰² Soil productivity in Greece, Sallares says, could have surpassed 650kg per hectare only under exceptional circumstances.¹⁰³

100 Kehoe (1988) 16f. Equally pessimistic about Mediterranean yields are Rickman (1980 = grain trade) 261; Herz (1988) 182; Rathbone (2000) 51.

101 Sallares (1991) 375.

102 Sallares (1991) 376ff.

103 Sallares (1991) 389.

However, seed yields are still important for the ancient historian for various reasons. First, the yield of seed was an important determinant of surplus, since it determined the amount of seed needed to continue production at the same level. Secondly, seed yield is a valuable indicator of productivity. The agricultural writers clearly use seed yields to express productivity in a general sense. Since we know that the sowing rates mentioned by the agricultural writers did not significantly differ from those in later times, there is no reason to assume that their seed yields reflect extremes in high or low levels of plant density. While there is some flexibility in choosing to maximise either seed or soil productivity by sowing lightly or densely, in practical terms there was a fairly restricted range at which the increase of seed productivity compensated for the reduction of soil productivity – or vice versa. Thirdly, there is the fact that ancient authors expressed productivity solely as seed yield. This evidence is best analysed in their own terms, since the conversion of seed yields into soil productivity relies on too many unknown variables.¹⁰⁴

In view of the importance of agriculture, and of cereal cultivation in particular, it is remarkable that the ancient sources offer only a few statements on agricultural productivity in cereal farming. Possibly, this reflects a lack of particular interest by wealthy landowners in the subject. Three passages are of value, and we shall quote all three in full:

On the soil of the Leontini district, it is customary to sow about one *medimnus* of seed wheat under stable and regular conditions. The land gives a yield of eightfold under favourable circumstances or tenfold by the blessing of heaven.¹⁰⁵

Cicero emphasises the fertility of the *ager Leontini*, but it did not suit Cicero's purpose in this passage to exaggerate the yields of the region. The remark is made during one of the orations against Verres, who had plundered Sicily during his three years of governorship. Only part of the Verrine orations (the first *actio*) was actually delivered in court; the second *actio* was published by Cicero after Verres had gone into voluntary exile.¹⁰⁶ The point Cicero wants to make in the context of the above passage is that during Verres' term in office the tax-farmers had extracted much more than could be justified. As the name of the tax – *decuma* – indicates, the Sicilian farmers should have been taxed with approximately one tenth of the harvest. However, under Verres' rule, the amounts gathered by Apronius, the tax-farmer of the *ager Leontini*, amounted to

104 Likewise Sallares (1991) 380.

105 Cicero, 2. *Verr.* 3.112.

106 Gelzer (1969) 44. Recently, Wilson (2000) 135.

much more than one tenth. When comparing the amount gathered by Verres' henchman Apronius to the harvests normally obtained in the region, Cicero mentions the above estimate of the yields in the *ager Leontini*. Cicero offers the following figures to his audience: the amount sown is 1 *medimnus* (= 6 *modii*) per *iugerum*, which in a very good harvest results in a yield of 10:1, hence 60 *modii* per *iugerum*. The *ager Leontini*, he says, held 30,000 *iugera* of arable land.¹⁰⁷ Hence, a very good year would result in a harvest of (30,000 *iugera* 60 × *modii* =) 1,800,000 *modii*. A reasonable tithe should be approximately one tenth of this, i.e. 180,000 *modii*. However, during the third year of Verres' rule, Apronius offered 216,000 *modii* for the contract.¹⁰⁸ Since tax-farmers intended to make a profit – which consisted of the difference between the amount of the contract and the tithe actually collected – Apronius expected to collect even more. In fact, Cicero alleges that he made a profit of 400,000 *modii*,¹⁰⁹ which means that more than 600,000 *modii* had been collected, or about one third of an excellent harvest.

Exaggerating the yield would merely have served to reduce the rapacious nature of the tithe that was actually gathered. The *ager Leontini* is purposely emphasised as the most fertile region of the island.¹¹⁰ The point is that if this exceptionally productive region was hit hard by the actions of the tax-farmers, the case will have been worse in other, less fortunate places. Equally, he had no reason to underestimate the yield, as his opponents would have easily disproved his figures if they had been too low. Cicero's case would have been best served by sticking to the most reliable figures he could find, and hence he can be assumed to be trustworthy when he indicates a yield of 8:1 as the result of a successful harvest, and a yield of 10:1 of an exceptionally good harvest.¹¹¹

Varro mentions seed–yield ratios as a sideline, when he puts his sowing rates in perspective: sowing rates depend on soil and location; hence, fixed rules cannot be given.

107 Cicero, 2. *Verr.* 3.113.

108 *Ibid.* 3.110.

109 *Ibid.* 3.111.

110 On the extent and fertility of Leontini's territory in Greek times, De Angelis (2000) 128f.

111 Contra Pritchard (1972) 648ff, who uses the following arguments: 1. Cicero's sowing rate of 6 *modii* per *iugerum* is too high. 2. Pliny states that the *ager Leontini* even yielded 100:1. 3. Thus, Cicero deliberately belittled the productivity of the *ager Leontini*. 4. Apronius' offer reflects the expected harvests and reveals the true productivity of the land. The conclusion: the true yield was 12:1 or 14:1. As far as I know, his arguments have failed to convince subsequent scholars. Cf. Evans (1981) 429f; Garnsey and Saller (1987) 80. See also Scramuzza (1959) 260.

Beans are sowed 4 *modii* to the *iugerum*, wheat 5, barley 6, spelt 10, the amount being a little more or less in some localities, more being sowed on rich ground and less on thin. You should therefore note the amount that is usually sowed in the district and follow this practice. For the locality and the type of soil is so important that the same seed in one district yields tenfold and in another fifteenfold, as at some places in Etruria.¹¹²

The sowing rate of wheat (5 *modii* per *iugerum*) is lower than the one given by Cicero (one *medimnus* = 6 *modii* per *iugerum*). Varro obviously regarded the yield of 15:1, which was obtained in Etruria at some places, as exceptionally high, compared to the 10:1 he also mentioned. There is no indication that he regarded 10:1 as above normal. It would have made little sense to illustrate the difference made by soil or location by comparing two exceptionally high yields. Rather, he compared a 'normal' 10:1 to an 'exceptional' 15:1. The question remains, 'normal' in what sense? Obviously, Varro did not think that 10:1 was an average yield throughout the Italian peninsula. Since he is writing a manual for wealthy landowners, it seems likely that he regarded 10:1 as not exceptionally high on the good arable land such landowners tended to cultivate.

It seems that Cicero and Varro provide reliable estimates of yields in cereal farming in Italy during Roman times. However, both figures reflect yields that are above average. Cicero refers to the fertile soil of the *ager Leontini*, Varro to the land cultivated by wealthy farmers. It does not follow that all farmers obtained such relatively good yields. Some modern historians regard even 8:1 or 10:1 as exceptionally high and in no way reflecting overall conditions in ancient cereal farming. Their lower estimates of yields mainly rely on two kinds of evidence: the lower yields in medieval and early modern agriculture and the much lower estimate of 4:1 provided by Columella. However, Columella's estimate is biased and therefore less reliable than the other sources. In his third book, Columella promotes the – in his opinion neglected – cultivation of vines as the most profitable option farmers in Italy had.

... when meadows, pastures and woodland seem to do very well by the owner if they bring in a hundred sesterces for every *iugerum*. For we can hardly recall a time when grain crops, throughout at least the greater part of Italy, returned a yield of four for one.¹¹³

The point Columella wants to make is that grain offers little profit compared to wine. His argument induces him to exaggerate the profitability

112 Varro 1.44.1. See also Evans (1981) 430; Garnsey and Saller (1987) 79.

113 Columella 3.3.4.

of vineyards, and at the same time to diminish the yields that were obtained in grain cultivation. At best, Columella provides a trustworthy figure for poor soils; at worst, his estimate is not reliable at all.¹¹⁴

J.K. Evans has made an unconvincing attempt to adjust the much higher yields provided by Cicero and Varro to Columella's yield of 4:1. He points out that half of the fields were turned to fallow each year. Hence, the productivity should be halved: 8:1 is actually 4:1 including fallow.¹¹⁵ This would have been a valid argument, if it had been made regarding soil productivity. One can agree that a certain area produces a certain harvest when cultivated entirely, but only half as much, when including fallow every other year. However, Evans incorrectly applies the same argument to seed productivity. Fallowing may have improved soil and thus increased yield, but whether the land is turned to fallow or not is irrelevant to the ratio between the amount sown and the amount harvested. A yield of 8:1 still means that 8 *modii* (and not 4) are harvested for each *modius* sown.

Comparative evidence

If we accept 8:1 and 10:1 as reliable estimates for fertile soil, the question still is what yields could be achieved on the arable land of less fortunate farmers. Comparison with later times may provide insight into the range of yields obtained at those times and places, but in itself comparative evidence provides no clear answer, because it remains uncertain what comparisons provide the closest parallel to ancient farming. Indeed, yields in many regions of medieval Europe were low. For instance, it is estimated that yields in fourteenth-century Macedonia usually were 3:1.¹¹⁶ Yields in the larger part of Western Europe remained quite low throughout the early modern period. Even in the second half of the eighteenth century, average yields achieved in the cultivation of wheat in France were 6:1, and in Germany 5:1. At that time, intensive and innovative farming practices in England and Holland resulted in yields of respectively 8:1 and 10:1. H.W. Pleket has recently argued that the extremely low yields of the

¹¹⁴ See also Garnsey and Saller (1987) 79ff: 'There is nothing we can do about Columella except distrust him.' Also Pleket (1990) 78; (1993) 327.

¹¹⁵ Evans (1980) 135. Cf. White (1970) 49.

¹¹⁶ Macedonia: Laiou (1977) 68. In general, Persson (1988) 26. In contrast, the experiments at Rothamsted (England), during which wheat and barley were cultivated on the same fields year after year, show that yields of 6–7:1 could still be obtained. Two-field rotation even resulted in a yield of 8.5:1. Seavoy (1986) 70f.

Middle Ages reflect a serious decline in farming practices compared to the ancient world. The rising levels of seed productivity from the late Middle Ages onwards should be seen as a return to the higher levels of Roman times.¹¹⁷ However, the conditions in Western and Central Europe are not suitable for comparisons with Mediterranean farming. In the Mediterranean world, corn ripened under the conditions of dry, hot summers, thereby resulting in hardened grains of corn, which provided much better seed-corn than grain ripening under the relatively cold and wet conditions of summers in Central and Western Europe.¹¹⁸ Consequently, in the Mediterranean, a higher proportion of the seed sown germinated, resulting in higher yields. Hence, comparative evidence pointing to yields of 3:1 or 4:1 should be accepted as relevant only to farming in the most backward regions of the ancient world, and to farming in the cold and wet conditions of the mountain areas.

Comparisons should be sought in the Mediterranean world. Two points emerge from such a comparison. First, we should not underestimate the yields that could be obtained on good arable land. Secondly, yields differed significantly even within a limited area, due to the quality of soil and drainage. In her study of early modern Castile, C.R. Phillips makes use of seventeenth-century documents that allow her to distinguish between three types of land. We may summarise her figures for yields in the territory of Ciudad Real in 1751 as follows:¹¹⁹

first-quality land	winter wheat	9.0:1
	summer wheat	12.0:1
second-quality land	winter wheat	6.7:1
	summer wheat	8.6:1
third-quality land	winter wheat	3.7:1
	summer wheat	5.0:1

M.S. Spurr has gathered various figures on yields obtained in Italy from the Middle Ages to the twentieth century.¹²⁰ He stresses the importance of growth conditions, which resulted in lower yields on hilly land, better

117 Pleket (1993b) 326f. Also, (1990) 73f.

118 Hufton (1985) 111. Cf. Pelizzon (2000) 180. On the hardness of Sicilian corn, Epstein (1992) 291. See also Halstead (1987) 85 and Garnsey and Saller (1987) 78, who point out that the light and warm Mediterranean soils enhanced germination in comparison to the cold and heavy soils of the north.

119 Phillips (1979) 39.

120 Spurr (1986) 84ff. One may add the figures provided by Burke (1985) 183 concerning the Romagna for the period 1570–1619, which range from a minimum of 3.3 to a maximum of 8.2.

yields on flat land and the best yields on the fertile soil of alluvial plains. We may summarise his material as follows:

- 3/4:1, usual for the Middle Ages and on hilly lands of later periods.
- 5/6:1, average for flat lands in regions like Latium during the early modern period (1400–1700) or on medium soils later.
- 7/9:1, from 1700 onwards achieved on the flat lands of Tuscany, Piedmont and Lombardy.
- 10:1 and more, from 1700 onwards obtained on very fertile, alluvial soil.

One may add that during the late Middle Ages, yields in Sicily on average were 8:1 to 10:1, which agrees exactly with the estimates provided by Cicero on the *ager Leontini*. During the next centuries, Sicilian yields remained stable at this high level.¹²¹

It is not only on the basis of the figures provided by Cicero and Varro that we may assume that the levels of seed productivity in Roman commercial farming corresponded to those obtained in Spain or Italy during the sixteenth or eighteenth century. Three elements in Roman farming may be stressed: seed selection, manuring and crop rotation. First, as the evidence of the agricultural writers indicates, farmers in Roman times realised the importance of seed selection to maintain high yields. Varro offers the following advice: 'The crops that were the largest and best in the field should have their ears threshed separately so that the best seed can be obtained.'¹²² The writings of Columella and Pliny contain similar practices, which were based on the principle that the heaviest or largest grains of corn provided the best seed. Although these methods are not up to modern standards, there is no reason to assume that the methods of seed selection used in early modern Italy were any better.¹²³

Secondly, the agricultural writers agree on the importance of manure for preserving high levels of soil and seed productivity. They realised that smallholders might not have enough animals to manure their land adequately. Moreover, Roman agricultural handbooks mainly discussed conditions on estates in central Italy, which were probably better than

According to Bullard (1982) 279, at about the same time, yields in the Patrimonio and the Campagna were variously estimated from 6:1 to 8:1. See also the tables of Italian yields offered by Cipolla (1981) 124f.

121 Epstein (1992) 275; Garnsey and Saller (1987) 80. However, Davies (1983) 388 notes that in the 17th century, the smallholders in the village of Santa Ninfa usually obtained yields of 5 or 6:1, sometimes 8:1 or 4:1.

122 Varro 1.52.1. See White (1970) 187ff; Spurr (1986) 41f.

123 See Spurr (1986) 41 for a 19th-century example of seed selection, which is very similar to the one advised by Varro.

in the drier parts of Spain and Greece. Modern studies indicate that until the nineteenth century summer drought and lack of fodder kept the number of animals whose manure could be used on arable fields down. In general, Mediterranean lands may not have been manured optimally, but this was a problem of early modern farmers just as much as it was of ancient cultivators.¹²⁴ It used to be thought that the answer of ancient farming in general to this problem was fallowing, which restored fertility at the cost of optimal use of available land. According to these theories, ancient farmers were forced to let half of their land lie fallow because of the separation of arable and livestock. Like fallowing itself, the separation of the animals from arable farming was seen as a natural response to the climate and geography of the Mediterranean peninsulas. An integral part of this was the belief in large-scale transhumance in antiquity.¹²⁵

Thirdly, crop rotation was indissolubly connected to the shortage of animal fodder and, hence, the lack of manure. Crop rotation involved various crops that restored the nitrogen content of the soil after the cultivation of cereals. In addition to beans and other leguminous crops that served as food for humans, grasses and other kinds of fodder were sown on land that had produced several harvests of cereals. Integration of arable farming and livestock holding solved the lack of natural pasturage and thus the lack of manure in two ways: legumes restored nutrients in the soil after the cultivation of grains, and it offered fodder to supplement meagre pasturage. It is clear that wealthy farmers in Roman times knew the advantages of crop rotation and turned them into practice. If fallowing was still practised under some circumstances in the Roman world, this was no different in later times.¹²⁶ Again, sixteenth- or seventeenth-century

124 Varro 1.2.21; Columella 2.14.5, 7. Cf. *Inst.* 2.5.4. See Alcock et al. (1994) 145ff for the most detailed recent study on manuring in Classical and Hellenistic Greece. Also, Ruschenbusch (1988) 151ff; Garnsey (1992) 151. Morley (2001) 57, 59 is pessimistic regarding the importance of manure. On the shortage of fodder, see recently Garnsey (2002) 687. Simpson (1995) 40 points out that the dry conditions of much of Spain kept the number of animals in the early modern era low. Cf. Casey (1985) 212ff. Thus also in Palestine: Hamel (1990) 121ff. Epstein (1992) 290 notes that agriculture in late medieval Sicily benefited from close integration with animal husbandry. Already in Roman times, the importance of livestock on Sicily seems to imply a close integration with arable farming. Cf. Pritchard (1972) 646f; Verbrugge (1972) 535ff.

125 Now widely rejected. Recently, Waldherr (2001) 331ff. Cf. Leveau (2001) 143f.

126 Spurr (1986) 117ff; Halstead (1987) 81ff; Pleket (1990) 75f; (1993) 322ff; Lirb (1993) 266ff; Kron (2000) 277ff; Noack-Hilgers (2001) 162ff. Crop rotation, using legumes, oil or fodder crops, was known in Egypt, as Bowman (1986) 104 states. Regarding Greece, Osborne (1987) 41; Gallant (1991) 52ff; Alcock et al. (1994) 147ff. On the importance of legumes see in particular Flint-Hamilton (1999) 371ff. See also Sallares (1991) 301f; Garnsey (1992) 151f; (1998) 214ff = (1992) 317ff regarding Greece; Corbier (1999) 132f regarding Rome. Isager and Skydsgaard (1992) 110ff remain sceptical regarding crop rotation and the integration of arable farming and animal husbandry.

farmers seem to have had no advantage over their Roman counterparts. The predominance of short-term leases in central and southern Italy hampered the introduction of crop rotation until the nineteenth century. However, high yields were obtained in northern Italy in the fifteenth and sixteenth centuries on farms that had abolished fallowing by integrating cereal farming with cattle.¹²⁷ This system is not unlike the one described by Varro and Columella. Hence, there is no reason to assume that in Roman times commercial farmers did not generally achieve the high yields that are mentioned by Cicero and Varro.

Peasant-cultivators may have been a different matter, but there are opposing forces determining the yield obtained in small-scale farming in Roman times. On the one hand, it seems most likely that well-to-do farmers had seized the best soils. Only in isolated regions, which offered few marketing opportunities to commercial farmers, peasants may have worked fertile arable lands. Hence, the generally poorer soils cultivated by smallholders probably reduced the yields obtained in peasant farming. Secondly, peasants had little land to work, which may have increased the practice of inter-cropping. Thirdly, lack of manure and the annual cultivation of primary food crops on the same plots may to some extent have resulted in soil exhaustion. On the other hand, most peasant cultivators worked their land more intensively than their wealthy neighbours did.¹²⁸ Dio Chrysostom emphasised the productiveness of the well-manured fields worked by the rustic families he described.¹²⁹ Peasants may have provided sufficient labour to gather human excrement, compost and other forms of fertilisation, although manuring may have been limited to intensively worked gardens.¹³⁰ There is some evidence to indicate that in Roman Egypt even small farmers practised crop rotation.¹³¹ Unfortunately, we know next to nothing about sowing rates in peasant farming. On the one hand, their lack of land may have induced peasants to exploit fully the little land they had, which meant that high

They insist that a distinction must be made between Greek and Roman agriculture. Likewise, Sallares (1991) 382ff; Whitby (1998) 104ff.

127 Epstein (1998) 91.

128 In contrast, Garnsey (1980b) 37 assumes that peasants worked their land extensively, because they lacked the means for much investment. While it is true that peasants lacked the means for capital-intensive farming, most households held sufficient labour power to engage in labour-intensive farming.

129 Dio Chrys., *Or.* 7.15.

130 Spurr (1986) 127. Cf. Braudel (1990) 249f, who notes that in France intensively worked gardens were better manured than ordinary fields.

131 Sharp (1999a) 174.

sowing rates resulted in somewhat lower levels of seed productivity. On the other hand, lack of seed-corn may have caused the opposite strategy, leading to higher yields. Most likely, sowing rates in peasant farming depended largely on the year-to-year availability of land and seed, taking into account the number of mouths to feed and the result of the previous harvest.¹³² In general, it seems that the negative forces outweighed the positive ones; in other words, peasants probably achieved lower levels of seed productivity than wealthy market-orientated farmers did.¹³³ On average, yields in peasant farming may be estimated at 5:1 or 6:1. However, yields may have been lower on poor, mountainous lands, and higher on fertile, intensively worked soil.

Cicero's sowing rates and his estimate of seed productivity imply an almost equal soil productivity to Varro's. Cicero assumed a sowing rate of 1 *medimnus*, or 6 *modii*, per *iugerum*, yielding 8:1 during a successful harvest, i.e. 48 *modii* per *iugerum*. Varro's sowing rate of 5 *modii* per *iugerum* and yield of 10:1 indicates 50 *modii* per *iugerum*.¹³⁴ However, one has to keep in mind that Cicero's and Varro's figures do not represent average yields in Roman Italy and that yields may often have been substantially lower. A soil productivity of 40–50 *modii* per *iugerum* equals about 1,380–1,720ltr per hectare. We may compare this to early modern Europe: from the thirteenth to nineteenth centuries, soil productivity in France ranged from 800 to 1,800ltr per hectare.¹³⁵ In Spain (from the mid-eighteenth to the mid-twentieth century) average wheat yields sometimes exceeded a level of 1,000kg per hectare (approximately 1,400ltr), but only in years of exceptional harvests.¹³⁶ Under Turkish rule, soil productivity in some regions of Greece reached 1,000–1,500kg per hectare.¹³⁷ In contrast, during the first half of the twentieth century, average yields in Attica were about 630kg per hectare (800ltr) of wheat and about 790kg per ha (1,150ltr) of barley.¹³⁸

In sum, the comparative material for early modern Spain or Italy confirms that Cicero's 8:1 and Varro's 10:1 provide reliable estimates of yields on fertile soil and on lands highly suitable for the cultivation of cereals. Even an exceptionally high yield of 15:1 should not be rejected out

132 See also Halstead (1987) 85ff.

133 Cf. Pleket (1990) 77. Regarding Egypt, Rowlandson (1999) 156.

134 Columella's advice on sowing rates of wheat differed from Varro's in that he assumes 4 *modii* per *iugerum* of fertile land, 5 *modii* on a *iugerum* of land of moderate quality. Columella 11.2.75.

135 Grantham (1993) 486.

136 Simpson (1995) 36. At the start of the 20th century, Spanish wheat yields were among the lowest in Europe at 880kg per hectare (*ibid.* p. 17 n. 10).

137 Osborne (1987) 45.

138 Garnsey (1992) 149.

of hand. It seems likely that on the medium soils or hilly ground often cultivated by peasant farmers, an average yield of about 5:1 or 6:1 could be obtained. Only the worst conditions resulted in low average yields of 4:1 or 3:1.

Italy offers the most direct and detailed evidence of yields in cereal cultivation. The question remains how other Mediterranean lands compared to Italy. We may distinguish three regions that offer sufficient evidence to attempt a quantitative estimate of productivity. First, Egyptian yields were generally higher than those in Italy. However, reliable evidence is less abundant than might be expected. Most trustworthy are records from the Appianus estate at Theadelphia that indicate a yield of between 7:1 and 16:1.¹³⁹ Sowing rates were one *artaba* per *aroura* (about 3.7 *modii* per *iugerum*), as for instance shown by the loan of seed from public stocks to farmers who worked public land. Seed was usually lent without interest at a rate of one *artaba* per *aroura*, though slightly higher and lower figures are also known.¹⁴⁰ The rather light sowing on fertile soil partially explains the high seed yields obtained in Egypt. The tax rate on public land of up to 7 *art.* per *ar.* confirms high seed yields on such land.¹⁴¹ If the sowing rate on public land was 1 *art.* per *ar.* and the yield 7:1, a tax rate of 7 *art.* per *ar.* would not even have left the farmer with next year's seed. Hence, on land that was subjected to such high rates of taxation, the yield must have been closer to 16:1 than 7:1. Even stronger is the case concerning the rent on private land. Michael Sharp draws attention to the high rents attested by the archive of the so-called descendants of Patron (second century AD). The rents on the land of this family normally ranged between 11 and 15 *art.* per *ar.* Sharp points out that, if the tenants could usually expect to retain one third of the crop, the yield must have been between 16:1 and 22:1. Rowlandson rightly observes that the high rent on cereal crops should be seen in the light of crop rotation. Many land leases specify that a cereal crop should be followed by a fodder crop. While the rent in kind on the cereal crop was high, the rent on the fodder crop – usually in money – was very low. Nevertheless, the high level of rent on the cereal crop points to intensively worked, fertile plots, which is confirmed by the strict system of crop rotation that emerges from the lease contracts.¹⁴² Rowlandson concludes that both at

139 Rathbone (1991) 243f; Rowlandson (1996) 247. Cf. Rathbone (2000) 51: 'the average yield of wheat in Egypt was tenfold'.

140 Sharp (1998) 251f; (1999a) 169f.

141 See chapter six.

142 Sharp (1998) 94; Rowlandson (1999) 144f, 152f.

Tebtunis (in the Fayyum) and Oxyrhynchus, 'the metropolitan land-owning class managed to derive impressively high returns from the land they leased to local villagers under a system of crop rotation.'¹⁴³

Unfortunately, owing to the lack of trustworthy figures, yields in ancient Greece are much harder to estimate than those in Italy. One important inscription records the amounts of wheat and barley that were given to the sanctuary of Eleusis in 329/328 BC. Although we may be quite certain that the so-called Gift of First Fruits amounted to 1/1,200 of the wheat crop and 1/600 of the barley crop, and we may thus arrive at a reasonable estimate of the total harvest in Attica, some problems remain in estimating levels of productivity. Peter Garnsey has rightly pointed out that although we may accept the figures of the total harvest for the year 329/328 BC as correct, we still lack any reliable figures of sown area and sowing rate. Moreover, it remains a matter of debate whether this particular year represents an average harvest year or, as Garnsey assumes, a bad harvest year.¹⁴⁴ Garnsey proposes a seed-yield ratio of 4.8:1 of wheat and 6:1 of barley in Classical Attica.¹⁴⁵ However, on the basis of figures for Greece under Turkish rule, R. Osborne states that in many regions yields of 10:1 were possible.¹⁴⁶

Thirdly, Palestine has offered a wealth of passages on yields. Most of the Talmudic evidence dates to the second and third centuries AD and paints a picture of incredible wealth and immense fruitfulness in the past, while depicting poverty and infertility reigning in contemporary Palestine. Some historians have accepted these passages at face value and argued that traditions on yields as high as for instance 22:1, 45:1 or even 100:1 are historic.¹⁴⁷ Others have pointed out that such accounts reflect a belief that with the fall of the second Temple an era of hardship and famine had begun.¹⁴⁸ Hence, we should distrust the wondrous stories of past yields as much as those of current hardship. The following passage is the most informative evidence concerning yields in Roman Palestine:

143 Rowlandson (1999) 153.

144 Garnsey (1988) 95ff, 154ff; (1992) 147f. Cf. Whitby (1998) 108. Ruschenbusch (1988) 153 pointed out that we cannot rely on the figures for one year.

145 Garnsey (1992) 148.

146 Osborne (1987) 45.

147 Sperber (1977a) 400ff. Cf. Safrai (1994) 109f. On the origin (in the 2nd century AD) and purpose of the Mishnah, Neusner (1990) esp. ix, ix, 1ff, 15ff. The Talmud contains the subsequent amplification of the law-code that is given in the Mishnah.

148 Hamel (1990) 94ff; Lewit (1991) 69.

R. Ammi said in R. Johanan's name: Four *se'ahs* per *kor*. R. Ammi, giving his own opinion, said: Eight *se'ahs* per *kor*. An old man said to R. Hama, son of Rabbah b. Abbuha: I will explain it to you. During R. Johanan's time the land was fertile, during that of R. Ammi it was poor.¹⁴⁹

In other words, according to R. Johanan, it took four *se'ahs* of seed-corn to harvest one *kor* (= 30 *se'ahs*); according to R. Ammi, it took eight. The first implies a yield of 7.5:1, the second a yield of 3.75:1. The ancient commentator explains the difference as a decline from the good old days of prosperity. Some modern historians, such as Gildas Hamel, conclude that the yield was 5:1 or 6:1 'on average'.¹⁵⁰ However, while it may have the appeal of simplicity to take the average of both figures, there is actually nothing to indicate that this is methodologically sound. The above passage may be compared to evidence of yields in Palestine in the Byzantine period. Various documents relating to agriculture that date to the seventh century AD were found at Nessana in the Negev. One of these papyri records the amounts of wheat, barley and *aracus* that were sown and reaped. The three cases of wheat reveal a yield ranging from 6.7:1 to 7.2:1. The two cases of barley work out at 8:1 and 8.7:1. However, these figures should be treated with caution. In antiquity, the Negev surely was exceptional: extremely low levels of rainfall made irrigation necessary, while only little land was suitable for arable farming. Moreover, we do not know whether the harvest in these years can be regarded as typical.¹⁵¹ Hence, the yields in these documents may be higher than yields 'on average' in Palestine. The available evidence seems to indicate that in Palestine yields between 4:1 and 7:1 were not abnormal, but one should realise that the evidence is sparse.

Quantitative estimates

If the lack of interest in seed productivity in the ancient literature on agriculture is remarkable, the concept of labour productivity seems to have been unknown. It is not only that figures on labour productivity are completely absent in the writings of Cato, Varro or Columella, but also the idea that labour input might be varied seems entirely alien to their way of thinking. Columella provides figures for the required labour per

149 bBM 105b. Quoted from Hamel (1990) 127. Cf. Sperber (1977a) 419ff. However, it is unclear whether the passage refers to barley or wheat.

150 Hamel (1990) 127.

151 Mayerson (1984) 243ff. See also Hamel (1990) 130f.

iugerum for various crops, but regards these as fixed data. Because of this lack of conscious attention to labour productivity, combining Columella's figures on labour input with the figures provided by Cicero and Varro on yield is less than ideal. However, because the ancient sources offer no alternative way to arrive at some quantitative estimate of labour productivity, we may attempt such a calculation.

Columella provides the most detailed estimates of labour requirements in cereal cultivation. M. S. Spurr has combined these estimates with comparative evidence to arrive at the conclusion that 50 *iugera* of cereal land required 712 days' labour per year.¹⁵² However, estimating the labour requirement of each separate task and then adding these up may lead to a somewhat optimistic result, since time is often lost in preparation, waiting for the right moment, travel between tasks etc. Moreover, additional labour should be taken into account for supervision, maintenance of equipment, and other indirect labour requirements. Furthermore, man-hours are difficult to apply to the annual produce of land. Cereal cultivation involved heavy peaks in labour, which in commercial farming usually required additional day-labour. A conservative estimate of labour involved in the cultivation of 50 *iugera* of wheat should be between 3.5 and 4.5 man-years per year. Estimating 40–50 *modii* per *iugerum*, the produce of 50 *iugera* on the estates of wealthy landowners in an average year was between 2,000 and 2,500 *modii* of wheat. Hence, labour productivity in commercial farming may be estimated at between 450 and 700 *modii* of wheat per worker per year.¹⁵³

Applying Cato's advice on the ration of his agricultural slaves (4.5 *modii* of wheat per month in summer and 4 in winter),¹⁵⁴ the consumption of slave-workers on commercial estates was about 50 *modii* per worker per year. In addition, seed-corn had to be set apart for the next sowing, which on 50 *iugera* amounted to 200–300 *modii*. After subtracting consumption and seed-corn, a slave-worker in large-scale commercial cereal farming produced an annual surplus of between 330 and 610 *modii*.¹⁵⁵

Estimates of labour productivity in peasant farming are harder to achieve.¹⁵⁶ The ancient sources offer no quantifiable evidence concerning

152 Spurr (1986) 136ff.

153 2000 *modii* / 4.5 workers = 444 *modii* per worker. 2,500 *modii* / 3.5 workers = 714 *modii* per worker.

154 Cato, *de agri cult.* 56.

155 330 *modii* = (2,000 harvest – 300 seedcorn – 225 consumption) / 4.5 workers. 610 *modii* = (2,500 harvest – 200 seedcorn – 175 consumption) / 3.5 workers.

156 Even regarding 19th-century Spain, agricultural labour productivity is difficult to measure. Simpson (1995) 27 distinguishes three main problems: 1. low level of specialisation; 2. underestimation of female labour; 3. structural and seasonal underemployment.

peasant farming. Moreover, the conditions in peasant farming varied more than in commercial farming. On the one hand, well-to-do small-holders cultivated wheat on fertile soil; on the other, poor peasants worked on the poorest of lands, relying on barley rather than wheat to sustain their families. No one estimate can cover the whole spectrum of small-scale farming. Nevertheless, we may visualise the differences between labour productivity in large-scale cereal farming and on the farms of small-scale proprietors by offering estimates for the ‘ideal type’ of a poor peasant and that of a small farmer of modest means. An added problem is that we have no idea of labour input in small-scale farming. We can only reasonably estimate the produce on a peasant farm and relate this to the number of people within the household. However, household members were more fully occupied in agriculture in some seasons or years than in others. As we shall see in the [next chapter](#), peasant households exploited various productive strategies. In addition to grain, they may have raised cattle, pigs or sheep, sold herbs or vegetables on local markets, earned income by textile work or other wage-labour, and supplemented their annual income by day-labour at the harvest, vintage or haymaking on the farms of their wealthy neighbours. We can only offer an estimate of the grain annually produced, but not of the additional output by the household. In view of the low productivity on marginal peasant farms, supplementary income was often necessary in order to sustain the household. However, while we may not be able to estimate labour productivity itself in cereal cultivation on small-scale farms, we can arrive at some estimate of the surplus of grain produced in small-scale farming, which is the more important for our purposes.

Our ‘ideal type’ poor peasant owned a farm that contained 9 *iugera* of arable land on relatively poor soil. He grew wheat, barley and legumes (3 *iugera* each), which required much work in manuring the land to retain soil productivity. According to Varro’s and Columella’s figures,¹⁵⁷ we may assume a sowing rate of 4 or 5 *modii* of wheat and 5 or 6 *modii* of barley. The yield of wheat and barley may be estimated at 4:1 and 5:1 during normal years. Under these conditions, poor peasants produced 16–25 *modii* of wheat per *iugerum* and 20–30 *modii* of barley. Total production would be 48–75 *modii* of wheat and 60–90 of barley.

The amount produced above the household’s consumption requirements depended on the number of mouths to feed and their annual

¹⁵⁷ Varro 1.44.1; Columella 2.9.1; 2.9.15; 11.2.75.

consumption. Let us assume that there were 2–3 adults and 3–4 children within an average poor peasant household.¹⁵⁸ Roman soldiers and the slaves on Cato's estates received about 4 *modii* of wheat per month.¹⁵⁹ However, the diet of rural dwellers was undoubtedly much more varied than that of soldiers and agricultural slaves. Poor peasants probably relied much on foodstuffs other than grain. Moreover, peasant families included women, whose caloric requirements are lower than those of male adults, although one should also realise that barley is less nutritious than wheat. The annual consumption of grain of members of peasant families may therefore be estimated at between 30 and 35 *modii* for adults and between 15 and 20 for the children. Hence, total annual consumption of our peasant household can be estimated at between 105 and 185 *modii*.¹⁶⁰ In the worst case scenario – assuming lowest production, highest sowing rates and highest consumption – our poor peasants only produced half the amount they needed, since their average harvest was 108 *modii*, but they required 185 *modii* for consumption and 33 *modii* for seed-corn. The opposite case results in a modest surplus of 33 *modii*, the harvest being 165 *modii*, while 105 *modii* are needed for consumption and 27 *modii* for seed-corn.

The point of these calculations is not to establish exact figures of harvest, yield and surplus in poor peasant farming. However, we can visualise the range of what was likely. In the worst case, poor peasants were faced with too many mouths to feed and too little land to work, and therefore they had to rely on additional income or change their cropping strategy. Peasants of this type may have relied heavily on small flocks of sheep, on manufacture and on wage-labour. Hence, they were as much consumers on the corn market as they were producers. If they were any poorer, they would become rural proletariat rather than poor peasants. As I shall argue in the [next chapter](#), the rural proletariat will have been small, because in most regions there was insufficient employment for many such households to survive. Under the best of conditions (smaller families and better soil), poor peasants on average produced a small surplus (in our example approximately 20 per cent of the harvest).

¹⁵⁸ In comparison, about 50% of *all* households in 14th-century rural Macedonia consisted of 4–6 members. Laiou (1977) 227.

¹⁵⁹ Polybius 6.39; Cato, *de agri cult.* 56. The corn dole in Rome handed 5 *modii* of grain to each adult male recipient per month, but these amounts were not intended for their individual needs and are thus difficult to relate to individual consumption.

¹⁶⁰ 105 *modii* = 2 adults × 30 *modii* + 3 children × 15 *modii*. 185 *modii* = 3 adults × 35 *modii* + 4 children × 20 *modii*.

Of course, it is clear that there was a wide range of small farmers who had recourse to more and better land than the peasants in the above example. Let us for the sake of the argument assume a market-orientated farm consisting of a vineyard of 25 *iugera*, in addition to which 15 *iugera* were dedicated to wheat, 15 to legumes and olives. Sowing rates were 5–6 *modii* per *iugerum*; yield 6:1 or 7:1. These figures result in 30–42 *modii* per *iugerum*, or a total harvest of 450–610 *modii*. The family possibly contained more family members than our peasant, because more workers were needed to work all their land. Let us assume that the household contained 3–5 adults and 4–6 children and that their diet contained more grain than that of poor peasants. The result would be a total consumption of between 150 and 310 *modii*. In addition, a small plot may have been designated for the cultivation of barley to feed one or two mules. These well-to-do smallholders on average produced a surplus of between 65 and 370 *modii*.¹⁶¹

The above calculations give concrete form to the scope for surplus production in ancient arable farming. The starting point of the discussion was that seed and labour productivity are the predominant factors in determining agricultural surplus production. The low surplus production in peasant farming is mainly to be blamed on the unfavourable ratio between land and household members. Hence, it is not so much the fertility of a particular region that determined its surplus production of wheat, but rather the agricultural structure that predominated. In the above examples, one *iugerum* under cultivation of wheat produced a surplus of maximally 5.5 *modii* in peasant farming, between 4 and 25 *modii* on a market-orientated farm, and between 30 and 42 *modii* in large-scale commercial farming. Hence, a region of predominantly small-scale peasants might have produced a large harvest of corn, but the peasant-producers themselves largely consumed this harvest. In contrast, cereal cultivation in a region dominated by market-orientated farms and the estates of wealthy landowners produced a substantial amount of corn, and in addition large amounts of other agricultural products, such as olive oil or wine. The result should not be surprising, as the primary aim of small peasants was to produce at subsistence level, while market-orientated farms and wealthy estates produced goods for the market.¹⁶²

161 Harvest 450 *modii* – 310 *modii* consumption – 75 *modii* seedcorn = 65 *modii* surplus. Harvest 610 *modii* – 150 *modii* consumption – 90 *modii* seedcorn = 370 *modii* surplus.

162 Morley (2000) 213f agrees that, while peasant produce may have played an important role on the market in aggregate, the marketable surplus of villa estates was considerably larger. Schneider (2000) 57 makes the valid point that slaves had the important advantage that they usually did not have families to support.

However, it should be emphasized that the comparison between the peasantry and large-scale commercial farming is not on equal terms. The calculation of consumption on peasant and market-orientated farms took into account all members of the households, including those whose labour was (partly) employed outside cereal cultivation. In contrast, concerning the cultivation of grain on wealthy estates, we only included the consumption of those workers directly involved. A large part of what we have called the surplus of cereal cultivation on the estates of great landowners was not actually available for the market. While it was strictly speaking surplus wheat, because it was above the requirement to continue wheat production, it was not above the consumption requirements of the estate. On the basis of Columella's figures and Spurr's modern estimate, we assumed a labour requirement of 3.5 to 4.5 man-years in the cultivation of 50 *iugera* of wheat. However, a large estate comprised many more workers, whose exact number cannot be determined. Columella assumed a workforce of two ploughmen and six labourers on a 200-*iugera* farm, but according to his own account we should at least include a *vilicus* and a *vilica*, shepherds, and the female workers that Columella mentions as part of the workforce on an estate.¹⁶³ Estates could also include potteries, brickmaking, and textile production, which makes it hard to estimate the workforce of a 'normal' estate. Moreover, we have seen that part of the labour force on estates consisted of day-labourers, who took care of labour demand at peak times. Concomitantly, part of the rural population produced insufficient to take care of their households' needs, which forced them to earn additional income, partly as labourers on the estates of their wealthy neighbours. This means that part of the estate's grain harvest served to supplement the smallholder's own production. In sum, part of the so-called surplus of the estates of wealthy landowners was actually consumed by the oxen and mules, and by the rest of the workers on the estate, whether these were slaves or day-labourers.

Variability of harvests

If agricultural structure rather than fertility largely determines surplus production in cereal farming, this was even more clearly so when taking into account the high degree of variability of the annual harvest size. It was a fact of life that harvests under Mediterranean conditions varied greatly:

¹⁶³ Columella 2.12.1, 8. Cf. Spurr (1986) 136, esp. n. 13.

The sky has woven the fabric of the years with varying increase. Some it has enriched with great abundance of produce, some it has doomed to be ill-starred and barren, disappointing the countryman's labour with hopes that turned out to be empty and unfruitful.¹⁶⁴

The crucial point is that the input factors that are required to continue production are largely independent of previous production levels. On the one hand, a good harvest does not necessarily lead to higher sowing rates, although one possible use of the extra grain gathered in a good harvest is to increase next season's sowing rates. Furthermore, there is a limit to the increase of consumption after a good harvest. It is very unlikely that the rations of slave-workers on commercial estates were increased in response to an exceptionally good harvest. A large harvest slightly increases the demand for labour in harvesting, threshing and transport, but the difference is negligible. Of course, matters were different among poor peasants, whose meagre fare left some scope for the increase of consumption levels. Moreover, after a good harvest, peasants may have given a larger role in their diet to wheat at the cost of barley, which in good years may have been fed to the pigs. On the other hand, there was little scope for the reduction of seed-corn and consumption after a bad harvest.¹⁶⁵ There may have been some reduction of sowing rates, but this was a dangerous direction to take, leading to reduced productivity in the next year. The poorer the peasant, the less scope there was for the reduction of consumption levels, since these were marginal at best. Severe shortages might lead to structural changes, possibly leading to the migration of members of the family. In the short run, however, some insignificant elements apart, seed-corn and consumption were a fixed part of a fluctuating harvest. This means that the deviation from average levels of the harvest results in a more than proportionate increase or decrease of the level of surplus. The larger the proportion of seed-corn and consumption in overall production, the more this applies.

Hence, in peasant farming, even a limited decrease of the harvest might lead to the disappearance of agricultural surplus, often leading to shortages among households that on average produced a small surplus. The poorest families, who relied heavily on wage-labour and acquired corn from neighbours, were faced with severe shortages as soon as local supply was diminished. The reduction of surplus was less significant on market-orientated farms and estates. In contrast, good harvests offered surpluses

164 Prudentius, *A reply to Symmachus* 2.997ff.

165 Cf. Wrigley (1989) 243.

to farmers who normally just broke even. Good harvests led to improved living conditions among the peasantry, and to all kinds of strategies to transfer temporary surpluses into reserves that were more permanent. In good years, local supply was increased, while demand by poor peasants largely disappeared. In short, in a good year, almost everybody had corn to sell; when harvests failed, only a few had corn to spare. Whether the increase of the surplus of small-scale producers in good years caused a proportionate increase of market supply seems questionable, since their access to the product market was much weaker than that of their wealthier neighbours, while there were alternative non-marketing ways of using large surpluses.¹⁶⁶

Dio Chrysostom nicely illustrates the instability of marketable surplus in one of his discourses, in which he has to defend himself against the charge of unjust profiteering in times of dearth. He makes the following remark regarding the marketable surplus of his estates near Prusa (Bithynia, modern Turkey):

No man is more blameless than I am in connection with the present shortage. Have I produced the most grain of all and then put it under lock and key, raising the price? Why, you yourselves know the productive capacity of my farms – that I rarely, if ever, have sold grain, even when the harvest is unusually productive, and that in all these years I have not had even enough for my own needs, but that the income from my land is derived exclusively from wine and cattle.¹⁶⁷

Two important points emerge from this passage. First, the farms of Dio Chrysostom were dedicated to the market production of wine and cattle. While he did indeed grow grain, he emphasises that the grain produced was hardly enough to meet the requirements of his estates. The shortage of grain on his estates is stressed – even beyond credulity – to convince his hostile audience that he was a buyer, not a seller of grain. Secondly, the actual result of the harvest determined whether one had surplus grain to offer on the market or rather needed to buy. Not even after an excellent harvest, Dio wants to emphasise, did he have grain to sell, let alone during the present shortage. In other words, estate owners like Dio Chrysostom only had grain to sell that was superfluous to their needs, which largely depended on the size of the harvest.

166 Chapters [two](#) and [three](#) will deal with these issues in more detail.

167 Dio Chrys., *Or.* 46.8.

CONCLUSIONS

The division of labour between food-producing and non-food-producing sectors in the economy depends on the production of a surplus by the former and its distribution to the latter. The structure and scale of the economy are very much determined by the nature of the surplus production and its distribution, which is a more complex issue than it might seem at first sight. From the point of view of production, two levels of surplus can be distinguished. The first might be called 'gross agricultural surplus', defined by the strict definition: surplus = production minus input. As we have seen, continuation of production in cereal farming requires seed-corn and consumption by that part of the labour that is employed in producing the harvest. The ancient sources on arable farming allow a reasonable estimate of the gross agricultural surplus in cereal farming on the estates of the wealthy landowners. A surplus (thus defined) of 70 or 85 per cent fell well within the range of the possible. We are not able to estimate the gross agricultural surplus in peasant farming, since we lack the sources to quantify their input of labour in cereal farming and other parts of their work on their farm, and their employment outside their farm.

Part of the gross agricultural surplus was consumed within the unit of production in which it was produced. Members of peasant households who had put only part of their employment into cereal farming – or none at all – still took part in the consumption of the produce. The same applies to the commercial estates of the elite, whose entire workforce was ideally fed from the grain produced on the estate. The surplus that was left may be designated as the 'net agricultural surplus'. Since estates might comprise various kinds of cultivation and all kinds of enterprises, it is impossible to quantify the net agricultural surplus of a 'typical' estate, but it is clear that the net surplus was significantly smaller than the gross surplus. Moreover, the domestic workforce on the urban villas of the elite will largely have been fed from the produce of their estates, but this goes beyond the unit of production. In contrast, it is possible to arrive at a reasonable estimate of net agricultural surplus in peasant farming, which ranged from none at all (or even a deficit in some years) to some 20 per cent for a less marginal peasant. Peasants of modest means might gradually turn into market-orientated farmers, and the net surplus of the latter could be substantial. Finally, all agricultural surplus was subjected to the vagaries of the weather, which meant that the volume of surplus production fluctuated considerably between years. The smaller the scale of production, the more volatile was the net agricultural surplus.

CHAPTER 2

The world of the smallholder

INTRODUCTION

In his younger years, around the turn of the second century AD, the orator Dio Chrysostom was shipwrecked on the coast of Greece – so he tells us in his seventh discourse – where he found hospitality with two families of rustics, who led a simple, but happy life by tilling a small piece of land and keeping a few goats, a cow and a pig.¹ In addition, the men hunted deer and boar in the wilderness that surrounded their humble dwellings, which consisted of two huts for themselves and one hut for their stores. The story emphasises the simplicity of their life: their clothes are plain and made by themselves from the products of their little farm and from the animals they hunt. The food they have in store consists of what they have cultivated on their land. They have no money and do not buy or sell at the town market. The meat they have they do not measure, implying that there is no need to do so and, hence, that they do not sell it.² One of the two family heads had never been to town in fifty years.³ The other one had been, he tells us, when he was taken by a magistrate for trial before the town assembly on the charge of living off the public land without paying taxes or fulfilling the obligations of a citizen. In town, he was laughed at for not knowing the civilised manners of urban dwellers, but he gained the sympathy of the crowd by his naive account, not only of their poverty, but also of their happiness and generosity:

The man also asked me if we had any grain and about how much. I told him the exact amount. ‘Three bushels of wheat,’ said I, ‘six of barley and the same amount of millet, but only four quarts of beans, since there were none this year.

1 Dio Chrys., *Or.* 7.47. On Dio’s seventh discourse, Jones (1978) 56ff; Desideri (2000) 99f.

2 Dio Chrys., *Or.* 7.44.

3 *Ibid.* 7.21.

Now do you take the wheat and the barley,' said I, 'and leave us the millet. But if you need millet, take it too.'⁴

Of particular interest in Dio Chrysostom's story is that although these rustics lead a life of self-sufficiency – far from the city, which to them has nothing to offer – they are not completely isolated. One of the daughters is married to a wealthy man from the village, to whom they occasionally give game and vegetables. 'Last year we borrowed some wheat just for seed, but we repaid them as soon as harvest time was come.'⁵ Moreover, the fathers of the two family heads – free men, as we are told, and citizens of the city⁶ – had worked as hired herdsmen, until the wealthy landowner died and his property was confiscated.

Now our fathers remained in the huts at that time, hoping to hire out or find some work, and they lived on the produce of a very small piece of land, which they happened to have under cultivation near the cattle-yard. This was quite enough for them as it was well manured.⁷

Generally being self-sufficient did not preclude social ties, such as with nearby relatives. Moreover, they were part of the wider economy of the region by performing wage-labour (at least in the first generation). The degree to which peasants were tied into the wider economy will provide the main theme for the present chapter. Peasants were not isolated from the wider world in a social or an economic sense. The nature of these ties was determined by the peasant household's needs, their means of production, the products they could sell or buy, and the employment of their labour outside the farm. The thesis that will be studied here is that smallholders were only partially integrated into highly imperfect markets for agricultural produce and labour.

DEFINITION OF A PEASANT

The rural poor are almost as difficult to find in the ancient literature as industrial workers in the works of Jane Austen. The above example is rare, therefore, in providing such a detailed account of their life. However, it is a classic example in the sense that the evidence it provides is anecdotal and coloured by the urban elite's romantic and moralistic attitude towards the countryside.⁸ This is not to say that Dio Chrysostom provides a totally

4 *Ibid.* 7.45. For an analysis of this part of the seventh discourse, see Ma (2000) 111ff.

5 Dio Chrys., *Or.* 7.68

6 *Ibid.* 7.49.

7 *Ibid.* 7.15, 18.

8 Cf. Jones (1978) 61.

unrealistic picture. Even if his story is fictitious, Dio had sufficient knowledge of the 'real thing' to depict his rustics plausibly. Despite the exaggerations it contains of the rustics' simplicity and self-sufficiency, it offers a wealth of realistic detail, such as the importance of manure for their small plot of land and the location of the shepherds' camp at a place offering streaming water and sufficient vegetation, and a constant breeze to keep the gadflies away.⁹

However, even these items remain mere fortuitous scraps of information, without sufficient context for meaningful analysis. Even if we had two dozen such accounts for the Roman world, we would still lack the means for an in-depth analysis and reconstruction of the economics of the smallholder – if we were solely to rely on ancient evidence. Fortunately, it has become accepted method in the study of the ancient economy, and in particular of the ancient rural world, to make use of the insights that the study of societies that are much better documented has offered. Without the models that in particular the studies of peasants in medieval and early modern Europe have created, it would be impossible to approach the ancient evidence with meaningful questions, and all results would remain anecdotal.

The first problem to be addressed is that of terminology – or, rather, definition. Dio Chrysostom's rustics may be seen as typical peasants, in that they are poor and self-sufficient, cultivating a tiny plot and having little to do with the market. However, as even this simple story reveals, the term 'peasantry' may conceal social stratification and economic diversity. Besides the two 'peasant' families, there was also a wealthy son-in-law in a neighbouring village. Surely, his household was not that of a member of the local elite, but nevertheless that of a less humble farmer than his in-laws.¹⁰ In the present generation the families consisted of self-reliant farmers, but their fathers had tried to ensure survival by means of wage-labour, which implied dependency on the market. The term 'smallholder' may be used as a convenient term to designate that group within rural society that was involved in direct agricultural production and that was neither servile nor wealthy. However, in order to understand their economic behaviour we should distinguish between peasants and other types of small farmers.¹¹

9 Dio Chrys., *Or.* 7.14, 16.

10 Cf. the marriage bond between Daphnis' poor goatherd's family and Chloe's wealthy foster parents in Longus, *Daphnis and Chloe* 3.31.2f.

11 Likewise Banaji (2001) 192ff concerning the early Byzantine peasantry. On the wide range of variety that may be included under the term peasantry, see Langton (1998) 372ff.

The definition of the ‘peasant’ – and thus of other types of smallholders – should start from the realisation that peasants functioned economically in the unit of the household. This means that the size and composition of the household determine the consumption, not only of food, but also of other necessities. At the same time, the composition and size of the household also determine the labour that is available to fulfil these requirements. The peasant is thus defined, firstly, by the characteristic feature that the labour is employed in agriculture primarily to fulfil the basic needs of the household, and, secondly, that the labour, which is employed to fulfil these needs, consists of members of the household. In this regard, we may think of Varro’s remark that some farmers employ wage-labour and others do not: ‘All agriculture is carried on by men – slaves, or freemen, or both. By freemen, when they till the ground themselves, as many poor people do with the help of their families.’¹²

It must be stressed that neither element of the definition of peasantry requires peasants to consume much of their production directly, though this will often be the case. Both elements separate the peasant from the commercial small farm on the one hand, and the rural proletariat on the other. The market-orientated small farm – often designated as the ‘family farm’¹³ – primarily aims at producing for the market and it employs labour that is external to the household in doing so. The rural proletariat, on the other hand, provides the external labour in commercial agriculture (large-scale or small-scale) or other sectors of the rural economy. Market-orientated farms (or large estates) and rural proletariat often go hand in hand, as the one has need of the other.

On the basis of his analysis of the functioning of the households of Russian peasants at the end of the nineteenth century, the Russian economist Chayanov has provided the important notion of the ‘family cycle’. He pointed out that the size and composition of households change over time, and thus also the relationship between labour and consumption. However, his model is criticised for placing the peasant households too much in an economic vacuum. It should be stressed that the individual members of a household often use separate strategies to contribute to the household’s requirements. Members of a peasant household can, for instance, work as day-labourers or as artisans, thus contributing to the household separately from the land they cultivate. This

12 Varro 1.17.2. The most common interpretation of the text seems to be the one followed here. However, for a different interpretation, see recently Flach (1996) ad loc.

13 See above, p. 14 n. 7.

feature makes it impossible to delimit the peasantry in absolute terms from other rural groups, because a peasant household may always contain elements that are essentially separated from the 'peasant economy', but are part of wider agricultural or non-agricultural sectors. Where exactly does a peasant household that employs some labour in rural industry or wage-labour end, and an artisan's or day-labourer's household, which supplements its income by working a small plot of land, begin? The distinction is even less clear as the balance between the two is subject to short-term fluctuations, such as the size of the annual harvest, or the exchange value of crops, goods or services on the market. The employment of separate strategies can be seasonal, as the labour requirements on the farm change throughout the year, or more structural, as Chayanov emphasises, depending on the number of mouths to feed, the number of workers within the household, and the land on which this labour can be employed. In short, peasants were part of a wider economy, although their goals and resources were primarily determined by the household.

In all developed, pre-industrial societies (and the Roman world should certainly count as such), there is hardly a peasant household to be found that functions completely detached from the market. Hence, the market has its place in defining peasants. The market should be understood not only as the market for agricultural produce (the product market), in which the peasant may participate as producer and consumer, but also as the so-called factor markets, i.e. the markets for land, capital and labour.¹⁴ In order to distinguish the peasant from the commercial farmer, but at the same time integrate the market into the characterisation of the peasant, Frank Ellis has formulated the following definition:

Peasants are farm households, with access to their means of livelihood in land, utilising mainly family labour in farm production, always located in a larger economic system, but fundamentally characterised by partial engagement in markets which tend to function with a high degree of imperfection.¹⁵

Ellis's definition explicitly says on the one hand that peasants are integrated into markets (though partially), but it characterises these markets as 'imperfect'. The peasantry are thus also defined by the nature of the economy they are part of.¹⁶ Both the factor markets and the product

14 In contrast, Lo Cascio (2000) 77: '... the self-sufficient proprietor, who almost by definition existed outside the market'.

15 Ellis (1988) 12. See also p. 4. On this definition also Scott (1998) 2.

16 Cf. Finley's definition (1985) 105. On the idea of the household in the Mishnah, which was limited to those families that farmed their own land, Neusner (1990) 50ff.

market should be taken into account. Scarcity of credit, an inflexible labour market and a constrained land market together constitute the 'ideal type' of an imperfect factor market. A low degree of market integration, resulting in a high instability of prices and an insecure exchange value of crops, goods and services, characterises an imperfect product market. As Ellis's definition recognises, this is not an on/off situation, but a matter of degree, which in fact adds to the inexactness of the definition of 'peasantry'.

The question of whether the smallholders of the Roman world can be designated as peasants therefore depends on the characterisation of the Roman economy in its entirety, which leaves one in a quandary where to begin, since the hypothesised peasants are part of the economy as a whole. Moreover, it is precisely the imperfection of these markets that leaves much scope for regional diversity. In the ancient world, the 'complex' and the 'primitive' operated side by side, as for instance observed by H.W. Pleket:

Primitive, pre-capitalistic features were typical of large sectors of the economy both of the Roman Empire and of the European Middle Ages and Ancien Régime...; but at the same time in both periods there were 'niches' of a more capitalistic economy, characterised by structural long distance trade in staples (wine, oil, grain) and luxuries (textile, spices, marble) and by production of those goods for the market.¹⁷

The Roman Empire was therefore essentially similar to medieval and early modern Europe in the diversity of development of the various regional markets and sectors of the economy. This similarity makes the peasantry of European society a valuable comparison for the Roman world, while the lack of a wider, non-peasant economy reduces the usefulness of comparisons with tribal societies.¹⁸

Imperfect markets gave an important role to non-market relations in pre-industrial societies. In their purest form, the market-orientated farm (or agricultural enterprise) and the rural proletariat are part of highly perfect markets: the rural proletariat ensures a flexible labour market, while the market-orientated farm uses its control of capital and land to ensure efficient production and can rely on a highly integrated (but local) market for a stable demand for its products. The market-orientated farm thus functioned in a situation where economic relations between producer, labour and consumer operated through free market channels. However, it was precisely the imperfection of these markets that led to the

¹⁷ Pleket (1993b) 317.

¹⁸ Cf. Sherrat (1995) 5f, on the unsoundness of the belief that 'traditional' societies are unchanging and thus reflect the remote past.

importance of non-market mechanisms in the social and economic interaction in pre-industrial societies, including the Roman world. Self-reliance within the household and autarky within the community remained important goals; social exchange was an important means to connect households within the community. The large role played by coercion and power relations in the distribution of agricultural produce and other goods reflects the same situation on a larger scale.

The question of definition of the peasantry has resulted in a few criteria, but also in the realisation that it is an inexact term, due to the partial participation of the peasant household in strategies that are part of a wider economy. Peasants (regardless of whether they were working their own land or someone else's land as tenants) rely on the labour capacity available in their household; their primary aim is to support its members. In other words, the peasant household is a consumption and production unit, not an entrepreneurial unit, as the market-orientated farm may be designated. Since the wider economy is diverse regionally and in the development of its various sectors, the result is not a uniform 'peasant type'. Rather it is a spectrum, with market-avoiding, subsistence peasants at the centre, gradually evolving at one end into farms that are market-orientated in order to extend the resources of the household beyond subsistence, and at the other end into artisans and labourers, whose labour is not exploited in a peasant farm, but more in commercial farming or other sectors of the rural economy.

Accordingly, the purpose of this chapter is not to discuss the 'peasant type', but the spectrum of the smallholder. Ideally, this should involve a full discussion of the entire economy of the Roman world, but that would surely be beyond the scope of this book, let alone this chapter. Some aspects, such as marketing and market integration, are postponed until the next chapters, which will deal with commerce and the economics of commercial agriculture. On the other hand, since in a developed pre-industrial society, small-scale agriculture is indissolubly connected to large-scale commercial farming, it is inevitable that some aspects of the latter will be discussed in this chapter. The economy of the smallholder will be discussed in this chapter under three headings: (1) household and labour; (2) alternative strategies; (3) household goals and the market.

HOUSEHOLD AND LABOUR

The Roman author Pliny the Elder realised that the production and consumption of peasants are determined by the household, when he

wrote: 'Good farming is essential, but superlatively good farming spells ruin, except when the farmer runs the farm with his own family or with persons whom he is in any case bound to maintain.'¹⁹ Pliny refers to the fact that the input of labour cannot be increased indefinitely without reducing its productivity, but, he adds, productivity is of no concern to those who work the land with members of their family, since these are to be fed anyway. According to Pliny, such farmers are only interested in overall production, not in levels of productivity.²⁰

Generally, labour was the only means of production they could command freely, because, as we have seen in the [previous chapter](#), peasants had little land or capital at their disposal. Consequently, peasants had little flexibility in balancing their means of production. However, large families to work the land were a mixed blessing. The neo-classical law of diminishing marginal returns rules that high levels of input of labour, which are not matched by concomitantly high levels of input of other production factors, result in low labour productivity. The level of output of the peasantry in the Roman world was curtailed by their low access to land and capital. In turn, the level of output determined the optimal use of labour. In other words, in order to optimise the balance of production factors and secure a high labour productivity, ancient peasants should have been satisfied with a low input of labour, which would have resulted in a low overall production. Whether the peasants of the Roman world could pursue such a strategy was determined by three crucial elements: the availability of labour, the opportunity to employ their labour independently from their peasant farm and the required overall production from their agricultural labour.

Chayanov's family cycle

In general, the employment of peasant labour is related to the size and nature of the household, the position of the household in the labour market, and the relation between production and consumption within the household. In this regard, the studies by Chayanov of the Russian peasantry during the late nineteenth and early twentieth centuries have been

¹⁹ Pliny, *Hist. nat.* 18.38. I follow here the interpretation of Scheidel (1992) 354f.

²⁰ Scheidel rightly says: 'Die Stelle nimmt somit auf die Subsistenzwirtschaft von Bauernfamilien Bezug, für die die intensivste Bewirtschaftung deshalb möglich sei, da der "labour input" mit keinerlei Kosten verbunden ist.' However, the question is also whether there were alternative options of employment for this labour.

very influential. Chayanov emphasised that the size and composition of the household largely determined the consumption need of the household and at the same time the labour capacity to achieve this requirement.²¹ However, a household is not a stable entity, because marriage, births and deaths constantly change its size and composition, which, as Chayanov pointed out, has important implications for the development of the ratio between workers and consumers within a household. Succinctly put, a family starts out small: it has only a few members, and thus a low labour capacity and a low consumption requirement. The birth of new family members increases its consumption need without at first adding to its labour capacity. At some point – according to Chayanov, about the fifteenth year after marriage – the consumption need does not rise anymore, while the growing up of the children increases the family's labour capacity. Thus, not only the overall level of production and consumption changes, but also the consumer–worker ratio develops according to a continuous cycle.

Although marriages and births are partly governed by economic circumstances such as access to land and capital, the household is not easily adapted to its labour requirement. In his recent study of survival strategies of peasants in ancient Greece, T.W. Gallant has made extensive use of Chayanov's concepts of the family cycle and consumer–worker ratio to construct a 'household vulnerability cycle'.²² Although primarily dealing with ancient Greece, his conclusions should be valid for the Roman Empire as well. His reasoning may be summarised as follows: first, he combines a reconstruction of the family cycle of a 'typical peasant family' with an estimate of the diet of men, women and children in ancient Greece to establish the required production of that family throughout its family cycle. Using twentieth-century figures on yield and labour requirements to produce the necessary amounts of grain, legumes, olive oil and so on, he establishes the amount of labour that was needed to produce the required amounts of food throughout the family cycle. Furthermore, he assumes that peasant households would have worked plots of four to six hectares. On the basis of these variables, he concludes that a peasant family at some stages of its cycle experienced a serious surplus of labour, while at other stages there would be not enough labour available to

21 Chayanov (1966) 56ff. His hypotheses have been rightly criticised for their rigidity, but in principle the cyclical development of the consumer-worker ratio remains a valuable concept. Cf. Medick (1976) 298f; Ellis (1988) 106ff.

22 Gallant (1991) 60ff.

cultivate the four to six hectares of their farms. The wealthier families, he suggests, would have bought slaves to supplement their family labour. He adds that, although there was some scope for variation, families were more vulnerable to disruption of food production at one stage of their family cycle than at another.

However, there are some basic flaws in this construction of the 'household vulnerability cycle'. The first problem is Gallant's method of establishing the main variables. The point is not so much that the use of comparative evidence offers many difficulties in reconstructing ancient levels of production, consumption and labour input, although his accumulation of modern figures seems to offer more exactness than is warranted.²³ Most importantly, these variables are not fixed entities. His use of fixed variables ignores the fact that yield, cropping strategies and labour input can vary, determined by access to production factors and, basically, by choice. The second problem with Gallant's construction is that he ignores family relations.²⁴

Household formation

Household patterns and their regional and social variations in the rural population of the ancient world are a topic that is, as so often, of no interest to our sources. However, it does seem very likely that many complex households existed. Extended households are defined as one conjugal unit (i.e. husband and wife, possibly with children) with relatives, multiple households as several conjugal units co-residing, possibly with other relatives. On the basis of the available source material, scarce as it is, it has been postulated that the nuclear family predominated in the Graeco-Roman world. Nuptiality, i.e. the marriage rate, was high and young adult males would marry and form new households. It is quite possible that in an elite and urban context, to which the sources almost exclusively pertain, nuclear families were most usual.²⁵ However, the

23 Labour input is an important case in point, for instance his figures on the cultivation of wheat and barley. Regarding modern Greece, so Gallant informs us, estimates are 26 man-days per ha of wheat and 20 man-days per hectare of barley. Other Mediterranean regions vary between 45 and 70 man-days. In his calculations, Gallant quite arbitrarily uses 48 man-days per ha. Cf. the warning by Halstead and Jones (1989) 53: 'great caution should be exercised in extrapolating recent labour and production norms back into the distant past.'

24 Despite his own – and correct – emphasis on the complexity of ancient households. Gallant (1991) 11ff.

25 Saller (1984) 336–55; Saller and Shaw (1984) 124–56. Cf. Gallant (1991) 12ff; Garnsey and Saller (1987) 126ff; Sallares (1991) 194f. The methods of Saller and Shaw are rightly criticised by Martin

census material from Roman Egypt shows that newly married couples did not regularly form new households, but remained within the parental household.²⁶ However, the study of household patterns in other, better documented societies shows that household patterns are determined by the demographic, social and economic conditions under which people live, and that, accordingly, various patterns co-existed within the same society. This is not to deny the role of cultural elements like morals and values. However, morals did not prescribe exact and rigid rules regarding household patterns. Rather, the considerations regarding household structure and family life were made according to social and economic conditions within the range of culturally accepted behaviour.

Households were units of production that shared the means of production, such as land and labour. At the same time, the produce of the household, whether it consisted of food or other goods or money, was shared between the members of the household. Because households were units of production and consumption, the formation of these units was partly governed by those circumstances that governed production and consumption. In other words, access to land and capital, and the employment opportunities for labour in agriculture or other sectors of the economy, are variables within patterns of household formation, not external factors on a rigid, uniform family pattern. The structure of households therefore tended to vary strongly with social and economic groups. Moreover, despite existing ideals and expectations, people adjusted rapidly to changes in conditions, resulting in altered household patterns. This means that the available source material should be differentiated at least according to social and economic background, and to rural and urban context. However, the problem is that the sources provide hardly any evidence specifically regarding the peasantry and small farmers of the ancient world.²⁷

(1996). Saller and Shaw had analysed relationships in funerary inscriptions between the dead and the ones commemorating them. Parent-child relationships counted as nuclear. One of Martin's main arguments is that 'their study demonstrates only that most people depended on members of their immediate family for commemoration; it does not demonstrate, and should not be taken to imply, that other "non-nuclear" relationships were absent' (p. 45). Furthermore, 'their procedure is methodologically biased to emphasize the nuclear family and de-emphasize the extended family from the outset' (p. 47).

26 Bagnall and Frier (1994) 61.

27 Saller and Shaw (1984) 127: 'There is so little epigraphic material for the rural areas that it must be admitted that our conclusions do not apply to them.' Local variations and differences between social groups are emphasised in Saller and Kertzer (1991) 4.

The limited access to land and the absence of many secure subsistence strategies in a vulnerable economy do point either to high ages of marriage and a large proportion of people never marrying at all, or to a large role for extended or multiple households, or to a combination of both. Nuptiality in the Graeco-Roman world may have been restricted to some degree, but it is highly unlikely that it was sufficiently low to invalidate the assumption that population pressures on the land resulted in a high proportion of extended or multiple households. Limited access to means of production stimulated the co-operation between close relatives, which often, though not always, resulted in co-residence. Co-residing relatives are seen as a household, co-operating relatives are not, although from our point of view the difference is marginal.²⁸ The two families of rustics in Dio Chrysostom's seventh discourse provide an interesting example of an ancient rural household:

As we proceeded on our way, he told me of his circumstances and how he lived with his wife and children. 'There are two of us, stranger,' he said, 'who live in the same place. Each is married to a sister of the other, and we have children by them, sons and daughters.'²⁹

We learn in addition that their fathers had died about a year ago, but that of the mothers, one was still living. One of them has a daughter of marriageable age, who, at the end of the little story, is married to the son of the other. (Note that they are full cousins twice over!) They live in two huts, and have a third where the stores are kept. In the account of their possessions, no distinction is made between the land and animals of the two families. These are two families, who, if not exactly sharing one hut, at least nearly do so, and who clearly share their resources. In other words, Dio Chrysostom's rustics formed a co-residing and co-operating multiple household. Lacking epigraphic or other documentary evidence, Dio Chrysostom's seventh discourse, Apuleius' *Metamorphoses* and similar sources may be about the closest that we can come to the families of the common people in antiquity (outside Egypt).³⁰

Complex households are a social risk-management strategy in that they distribute available resources across more people.³¹ There was often no

28 Regarding the Mishnah, Neusner (1990) 65 observes that 'co-residence is not always essential in designating a person a part of a household.'

29 Dio Chrys., *Or.* 7.10.

30 One may also think of Longus' *Daphnis and Chloe*. Various aspects of family in the *Metamorphoses* of Apuleius are recently discussed by Bradley (2000) *passim*. He notes that the families depicted in the novel range from the very simple to the very complex (p. 289).

31 Cf. Seavoy (1986) 24.

alternative but to share the same resources in making a living. This consideration is supported by the predominance of partible inheritance in the ancient world,³² which stimulated economic co-operation between near relatives, especially brothers (and possibly sisters) with their wives (and husbands) and possibly children, which means that they worked together and shared means of production such as land, animals and tools.³³ For instance, according to early medieval law in Italy, where partible inheritance predominated, it was common for heirs to hold property jointly and undivided.³⁴ The practice of sharing of property is also alluded to by Apuleius. When the husband of an adulterous wife discovers her hidden lover, he is charmed by the boy's good looks:

I will treat you as the joint property of my wife and me. Instead of a probate to split an estate, I will institute a suit to share common assets, contending that without controversy or dissension we three should enter into contract in the matter of one bed.³⁵

By jokingly applying the practice concerning the division of property to the shared possession of this unfortunate boy, Apuleius shows that in the Roman Empire joint property could lead to co-operation between relatives. The practice must have been common enough for the joke to work. The papyri offer additional evidence concerning Roman Egypt, where joint heirs often retained common and undivided ownership of land, houses and other property. According to Jane Rowlandson, in Egypt joint ownership was most common among smallholders.³⁶

Moreover, complex households offered a solution for the problem addressed by Gallant: the labour capacity within nuclear households and the number of mouths to feed fluctuated continuously, sometimes resulting in an unfavourable balance. It has been pointed out that in early

32 According to Rowlandson (1996) 139ff, esp. 141, an 'extreme' form of partible inheritance predominated in Roman Egypt, whereby women inherited part of the land. See also Sharp (1999a) 167f, 182ff; Alston (2002) 67ff. Saller (1991) 26–47 points out that, though there was a legal and social tendency to favour equal partible inheritance, the laws provided the tools for a wide range of behaviour regarding inheritance.

33 One may point for example to the relationship between partible inheritance and the lack of alternative economic strategies among the sharecroppers in early modern Tuscany and the high proportion of extended households. Cf. McArdle (1978) 137f; Ring (1979) 19. Cf. Brettell (1991) 353: 'Though partibility should in principle establish independence, it often requires interdependence and cooperation among siblings.'

34 Ring (1979) 16.

35 Apuleius, *Metam.* 9.27.

36 Rowlandson (1996) 144, 173. For an example of undivided ownership in a lease contract, Rowlandson (1999) 142f. Cf. Sharp (1999a) 172. On co-ownership in Roman law, Lirb (1993) 279ff.

modern Europe the cyclical imbalance between workers and consumers caused the temporary complexity of households, which at a later stage evolved into nuclear households. 'The extended family is merely a phase through which most families go.'³⁷ In early modern Europe, the shortage of workers in one household also often led to the temporary transfer of relatives, especially older children or young adults, from a household having too many mouths to feed to one in need of labour.

Historians of early modern Europe warn that uniform 'European household patterns' or 'Mediterranean family models' should be treated cautiously. Within broad patterns, there was considerable regional variation.³⁸ Despite our emphasis on multiple and extended households, recent research points out that nuclear households predominated throughout early modern Italy and the Iberian Peninsula. A proportion of complex households of 25 to 30 per cent in some communities is regarded as high. However, even a percentage of 10 to 15 per cent, which seems to be a common feature of most regions in early modern Italy or Spain, is significant.³⁹ It means that a relatively high proportion of individuals at one time or another were part of a complex household. Moreover, among particular social groups, such as smallholders, the percentage of complex households was larger than among the population in general. Furthermore, co-residence and economic co-operation may generally coincide, although they are not automatically connected.⁴⁰ Households could reside separately, but still co-operate, working the same land and using the same working animals and implements. Co-operation between relatives is not limited to the lower classes, as the example shows of three brothers who held their several estates in Sicily jointly.⁴¹ Regarding medieval and early modern Europe, examples abound of the sharing of resources between relatives of different households. For instance, in late medieval Macedonia, separate households often held joint property. While household and family changed cyclically in accordance with the succession of the generations, they retained joint property and continued economic co-operation.⁴² Since co-residence and co-operation are not essentially linked, the degree to which households shared resources

37 Berkner (1972) 398–418 (quote from p. 405).

38 In particular, Benigno (1989) 165ff.

39 Benigno (1989) 169f. Cf. Ruiz (1998) 56f.

40 Alston (2002) 69ff offers insight into the complexity of households and residence in the sole region in antiquity for which we possess any real evidence – Egypt – where for instance we find brothers who seem to form separate households but share a house (p. 75).

41 Cicero, 2 *Verr.* 3.57.

42 Laiou (1977) 73ff.

may have been substantially larger than the proportion of complex households.

Despite regional variation, two elements can be put forward as strongly correlated to household formation: settlement pattern and the role of labour markets. Co-operation between separate households occurred most often when the rural populace cultivated small, dispersed plots, while living in nucleated settlements. In such a context, there was no need to co-reside in order to co-operate. Co-residing and co-operating multiple or extended households, on the other hand, are found more often in populations that lived in dispersed farmsteads, such as Dio Chrysostom's peasants.⁴³

Furthermore, the nature of household subsistence strategies and the degree to which the household functioned as a productive unit strongly influenced household formation. When the economy offered many employment opportunities outside the family farm, the urge to form complex households was small. With the development of flexible labour markets, the proportion of complex households tended to decrease. Therefore, towns and cities may have shown a very small degree of household complexity. Note for instance the following conclusion: 'In the cities of central and northern Italy, nuclear households and neolocal marriages were common, at least from the fourteenth century, while in the surrounding countryside complex households and patrilocal residence on marriage remained the rule.'⁴⁴ Hence, the exclusively urban sources on family patterns in the Roman world are no indication of the predominance of nuclear families in the countryside, and thus among the majority of the ancient population.

Confirmation can be found in Roman Egypt. The analysis of census material by Roger Bagnall and Bruce Frier shows that 'households with extended and multiple families are a very large proportion of all households.'⁴⁵ They also observe that extended and multiple households were even more common in the countryside than in the metropolises. After correcting the various biases in the extant census material, 'it is likely that, in Egypt as a whole, at least three-fifths of principal family members lived

43 Thus Barbagli and Kertzer (1990) 375 regarding nineteenth- and twentieth-century Italy. The same considerations apply in the Roman world. Cf. Kertzer and Brettell (1987) 92 and 113: 'Both southern Italy and southern Portugal were characterized by agrotowns, and these are the areas where large, complex family households were, in general, least frequent.' Likewise, Benigno (1989) 181. Cf. Epstein (1998) 93ff.

44 Benigno (1989) 182.

45 Bagnall and Frier (1994) 59. See also the comment in Scheidel (2001) 14ff.

in complex households. Further, since smaller and simpler households are likelier to be well preserved in the returns, even this estimate is doubtless too conservative.⁴⁶ Since many factors were involved in determining household patterns, it cannot be argued that these figures apply outside Egypt. Nevertheless, they confirm the large role of complex households in demography and economic life, and the differences between the urban and rural context that we have seen above.

Complex households are most common in regions characterised by undeveloped labour markets, where the household is the main unit of production. Rural families whose primary subsistence strategy was based on the employment of their labour on the labour market, such as artisans and wage-labourers (although they may have cultivated a small plot on the side), predominantly had nuclear households. Small-scale tenants on short-term leases, whose access to land was flexible, also lived primarily in nuclear families. Households of well-to-do family farmers did not function as a production unit, but rather as an 'entrepreneurial' unit. They did not depend on family labour, nor was there any shortage of land. Hence, they were primarily nuclear, the more so when they specialised in crops that showed a marked peak in labour requirement, which was dealt with by hiring seasonal labour. Therefore, complex households were rare in regions dominated on the one hand by large-scale, commercial estates and latifundia, on the other by small-scale tenants and day-labourers. Market-orientated farmers who worked mixed farms of considerable size or who grew labour-intensive crops wanted to ensure a large and continuous supply of labour and thus tended to have extended or multiple households.⁴⁷

For peasants, whose subsistence was directly based on their access to land, shortage of resources was a stimulus to form complex households, but at the same time, it constituted the main limitation to the formation of large households. Peasants working small plots and aiming at direct subsistence – in contrast to rural labourers – often had little choice but to share resources. However, if the land was insufficient, not only to offer enough food for a large number of mouths to feed, but also to offer meaningful employment for a large number of workers, other subsistence strategies had to be sought. Wealthier households may have had the means to lease additional land, but the poorer ones had to find employment that did not require initial costs.⁴⁸ Local opportunities might be

46 Bagnall and Frier (1994) 67.

47 See especially Benigno (1989) 178ff; Epstein (1998) 95ff.

48 Thus, Garnsey (1980b) 38.

found in wage-labour; seasonal labour might be found locally or elsewhere. Shortage of land may often have caused the structural flow of rural dwellers towards towns and cities, or towards the army and fleet. Migration, recruitment to the army or navy, or similar options, were available only to a limited extent, since there were only limited opportunities to make a living.⁴⁹ Complex households did not offer the solution to all problems. To the peasantry, the formation of large households was often not an ideal, but a strategy to deal with unfavourable circumstances. The sharing of land, animals and equipment, and the transfer of relatives between households were part of timeless strategies within peasant societies to cope with insufficient resources and to diminish individual vulnerability to risk. Complex households thus functioned as a social risk-management strategy. As so often, however, they did so at a cost, in this case at the cost of labour productivity, when too many people had to work too little land.

Household labour

The matter of labour requirement was complicated by the fact that work on a peasant farm was not evenly spread throughout the year. The seasonality of agricultural life had important implications for the organisation of peasant farming: 'Many units of labour and animal power needed only for short spurts of work in grain farming had to be fed and kept all year. Different ways of harmonizing the seasonal dissonance accounted for much of the variation in peasantry from one part of Europe to another.'⁵⁰ The most serious peak in labour requirement was caused by the necessity to bring in the harvest in a short time. When grain is ripe, it has to be harvested quite soon, because it will otherwise shed its corn before harvest, thereby reducing yield. Moreover, ripe grain is severely damaged by rain and storm, which can be a serious threat during Mediterranean summers.⁵¹ Also, the danger of losses due to feeding livestock or birds, fire or theft urged farmers to gather the harvest in as short a time as possible. The processing of harvested grain was less urgent, provided that the farmer had recourse to sufficient storage. Legumes were less vulnerable to bad weather, but the dangers from animals or humans were no less. Hence, at harvesting time, farmers operated under considerable time stress.

49 Skydsgaard (1980) 70; Dyson (1992) 187. Regarding ancient Greece, Gallant (1991) 133ff.

50 Langton (1998) 385.

51 Halstead and Jones (1989) 49 (cf. 47); Sallares (1991) 55. In contrast, Morley (1996) 116.

Figures for the labour requirement of harvesting vary. The harvesting of cereals using a sickle on the southern Aegean island of Amorgos during the twentieth century was estimated at 10 man-days per hectare of cereals.⁵² Varro and Columella offer estimates of 1 and 1.5 per *iugerum* respectively, i.e. 4 and 6 man-days per ha.⁵³ Spurr points out that these estimates, which are considerably less than those for modern manual reaping, seem physically impossible. He proposes two man-days per *iugerum* (8 per ha) instead.⁵⁴ A peasant household, which had grown 2.5ha of cereals, therefore had to spend 20–25 man-days solely on harvesting grain during a relatively short period. In addition, legumes had to be harvested (which on Amorgos cost 3 to 10 man-days per ha, depending on the kind of legume). In comparison, one may add that in eighteenth-century France, it was a rule of thumb that 15–20 harvesters were needed to reap the area ploughed and seeded by four hands.⁵⁵ Concerning eighteenth-century France, it is also concluded that ‘the minimum ratio of peak to non-peak labour requirements in corn-growing regions was about two to one.’⁵⁶ Analyses of the labour requirement in peasant farming should therefore take into account that the peak requirement of labour was much higher than during the rest of the year. Moreover, poor peasants – in contrast to well-to-do farmers – could not afford to hire day-labourers to do part of the job. Hence, the avoidance of risk concerning the household’s primary income necessitated a secure labour supply during the peak season, which could only be found within the household.

As far as the employment of labour was concerned, two considerations shaped the farming strategies of peasants. In the first place, they strove to lower the peak demand in labour; secondly, they sought to provide meaningful work on the farm throughout the year. However, peasants who aimed at direct subsistence, i.e. those who produced on their farm the foodstuffs they considered essential for the sustenance of the members of the household, were limited in their choice of cropping strategies.⁵⁷ Such peasant farms primarily produced corn and legumes, which requires relatively much work, but the tasks are not evenly spread throughout the year. As we have seen above, cereal-based farming implied a large peak in

52 Halstead and Jones (1989) 47.

53 Columella 2.12.1; Varro 1.50.3.

54 Spurr (1986) 138 n. 19. On manning requirements in Roman farming, see also Duncan-Jones (1982) 327ff.

55 Grantham (1993) 484.

56 *Ibid.* 485.

57 Regarding the modern Third World, Alderman and Sahn (1989) 90ff.

labour demand at harvest time. However, there were several options to lower this peak. The first option was diversification of crops and of growth conditions. Diversification of crops lessened the time stress of farmers, since the growth cycles of various kinds of legumes and corn were not exactly alike. Beans, for instance, are ready for picking early in the year, while millet is harvested later. Since the various crops would ripen unevenly, the peak in labour demand of the various crops did not coincide.⁵⁸ Lower peak demand of labour was not the only advantage offered by crop diversification. It also constituted an adaptation to the uncertainties of agriculture in the Mediterranean region. By cultivating different kinds of corn and legumes, each with their own susceptibilities to extreme conditions, the risk of total crop failure was reduced. Using a metaphor from agriculture, Pliny explains that he employs various strategies in his forensic speeches:

As in agriculture, it is not my vineyards, or my woods, alone, but my fields also that I cultivate. And as I do not sow those fields with only spelt and winter wheat, but employ also barley, beans and the other leguminous plants, so in my pleadings at the bar, I spread at large a variety of matter like so many different seeds, in order to reap from thence whatever may happen to sprout. For the disposition of your jurors is as precarious and as little to be ascertained as that of soils and seasons.⁵⁹

Still, wheat and barley were the predominant crops in the ancient world.⁶⁰

Diversifying the conditions in which various crops were cultivated resulted in the same advantages. Fragmentation and dispersal of plots lessened the risk of total harvest failure on the level of the household by giving each farmer a share in different soil types and microclimatic circumstances, which each had a different susceptibility to adverse weather conditions. Since variation in growth conditions resulted in uneven ripening of crops, it also offered a means of lessening the peak at harvest time.⁶¹ Fragmentation of holdings made use of microclimatic differences in hilly lands. Harvest on a northern slope for instance is later than on a slope facing southwards. In Egypt, the reason for dispersal of landholdings was different, but the outcome was the same: to optimise the

58 Cf. Theophrastus, *H.P.* 8.1.2.

59 Pliny, *Ep.* 1.20.16f.

60 On crop diversification, Osborne (1987) 36f; Garnsey (1988) 49ff; Gallant (1991) 36ff. In Palestine: Hamel (1990) 109.

61 According to Fenoaltea (1976) 141ff, labour management was actually the sole purpose of fragmentation of plots. For a critique of Fenoaltea's and other theories, Persson (1988) 45ff.

access to irrigation and to diminish the chance that during a bad year an inadequate rising of the Nile left one's lands dry, it was wise to avoid concentration of holdings. In one particular sale, for example, about 100 *aroura* were sold fragmented in 22 holdings.⁶² Partible inheritance and the dowering of daughters achieved the dispersal of the land cultivated by each farmer.⁶³ Not only smallholders took these considerations into account, as is shown by Pliny's contemplation whether it was wise to have two estates in the same region, subject to the same weather and 'caprices of fortune'.⁶⁴ Diversification of crops and fragmentation of plots therefore had a dual purpose. By choosing different locations and soil types for the various crops, the peak demand in labour was lowered, and selecting the most suitable locations and soil types for the various crops in the long run increased total production, in comparison to a situation in which farmers specialised in one main crop.

Olives and vines offered peasants an opportunity to produce a profitable cash crop. (Also hay should not be forgotten as a profitable commodity, since the growth of cities meant an increase in the market for hay and other kinds of fodder.) However, olives were an unattractive crop for peasants, who had little land to farm, but many hands to employ, since olives were a labour-extensive crop. Moreover, since olives produce a crop only every other year, they not only offer no income once every two years, but they do not require any labour for harvesting in that year. On the basis of the evidence provided by Cato and Columella, Spurr has estimated that in a year without harvest, one *iugerum* under cultivation of olives requires only six man-days a year.⁶⁵ A farm of 5ha that was solely exploited as an olive grove would have offered only 120 man-days of work every other year. Cato's and Columella's agricultural manuals may not be directly applicable to peasant farming, but it may be doubted whether there was much scope for meaningful intensification of the labour input in olive cultivation. More land, offering more employment, was not available to smallholders. Hence, peasants may have had a few olive trees for personal consumption, especially on land not suitable for arable farming, but specialisation in olives was an unattractive option for peasant households. Instead, because it required little hired labour, it was a proper

62 Rowlandson (1996) 184, 197.

63 Gallant (1991) 42ff; Rowlandson (1996) 171f. Cf. Laiou (1977) 196f.

64 Pliny, *Ep.* 3.19.4.

65 Spurr (1986) 135. Sakellariou (2000) 105 points out that in 15th- and 16th-century Puglia, wealthier farmers, and not peasants, cultivated olive trees.

choice for well-to-do family-farmers that had sufficient capital and land to invest in olive cultivation.

The cultivation of vines, however, offered many advantages to peasant households. The labour requirement of vines is very high – according to an estimate concerning early twentieth-century southern Italy, vineyards required more than twice as much labour as arable farming.⁶⁶ On the basis of Columella, Spurr estimates 23.5 man-days per *iugerum* (94 per ha) a year.⁶⁷ Moreover, the tasks on vineyards are quite evenly spread over the year, thus offering work at slack times in arable farming.⁶⁸ Most importantly, the vintage – about September – occurs at a time when there is little urgent work in arable farming. Again, the workload of the vintage could be spread over a longer period by cultivating different kinds of vine, which – as Columella emphasises – should be grown in carefully distinguished sections. The farmer who acts thus

gains no small advantage in that he is put to less labour and expense for the vintage, for the grapes are gathered at the proper time, as each variety begins to grow ripe, and those that have not yet reached maturity are left until a later time without loss. Nor does the simultaneous ageing and ripening of fruit precipitate the vintage and force the hiring of more workmen at great cost.⁶⁹

However, there were some drawbacks: the processing of wine required investment in equipment. Lacking adequate means, poor peasants could not produce a quality wine. Hence, the price of this cash crop was necessarily low, while the selling of such cheap wine was restricted to the local market.⁷⁰ Huge profits were not to be made. The function of the vine was not limited to the field of economics, as Ruiz pointed out regarding early modern Spain: 'The peasants tended the vine for the profits it brought, for its nutritional value, for its pleasure, for gift-giving and hospitality.'⁷¹ Nevertheless, the land used for vines would necessarily reduce the land available for primary subsistence crops, such as grain and legumes (although not all land on which vines could be grown was suitable for arable). In so far as the land planted with vines offered a

66 Mentioned by Spurr (1986) 134f. See also Simpson (1995) 70 regarding Spain.

67 Spurr (1986) 135.

68 Thus, the point made by Kehoe (1988) 102 seems exaggerated: 'A *colonus* bringing only a small vineyard under cultivation still had to invest labor that might draw him away from crops already under cultivation.'

69 Columella 3.21.10. Although Columella obviously does not address peasant farming in this passage, the point remains the same: the workload of the vintage could be spread by cultivating different kinds of vine.

70 See also Simpson (1995) 73 (Spain).

71 Ruiz (1998) 66.

larger income than it would have had if used as arable, it offered a profitable way to increase the employment of labour on the farm. Nevertheless, the cultivation of vines on part of the land constituted a fairly limited means for large households to intensify the work and increase the income on a small peasant farm.

In this regard, the main advantage of many farm animals was that they offered a means to increase the meaningful employment of labour without reducing the land available for arable farming. Many smallholders owned some sheep and goats, keeping them largely for their own livelihood, possibly selling some of their products, like cheese and wool, on the market. Sheep, goats, but also chickens etc., provided products to supplement the cereal-dominated diet.⁷² Columella seems to imply widespread recourse to sheep's milk by the rural population, when he says regarding sheep: 'It is the sheep which not only satisfies the hunger of the country folk (*non solum agrestis saturat*) with cheese and milk in abundance but also embellishes the tables of people of taste with a variety of agreeable dishes.'⁷³ Significantly, he uses the general term *agrestes* instead of a more specific term, like *pastores*.

Pigs seem to have been omnipresent in the Italian countryside, as both literary and archaeological data indicate. Varro makes Tremelius Scrofa (whose cognomen refers to swine!) remark that pigs were kept on all farms.⁷⁴ Analysis of animal bones in Italy shows that pigs were present on all rural sites and that their numbers surpassed those of sheep, goats or cattle in the central and northern part of the peninsula.⁷⁵ Most peasants presumably owned a few pigs as a source of meat.⁷⁶ Dio Chrysostom's young suitor had got a piglet in the village, in exchange for a young boar he and his relatives had caught. This piglet was fattened on chestnuts and barley:

'So that is the reason why your mother would laugh,' exclaimed the father, 'when I used to wonder on hearing the pig grunt, and you were using the barley so freely.' 'Well,' he replied, 'the chestnuts were not enough to fatten her, supposing she had been willing to eat nuts without anything else.'⁷⁷

72 On peasant ownership of a few animals, Evans (1980) 143; Hodgkinson (1988) 60. On sheep and goats in Classical Greece, Jameson (1988) 100; Isager and Skydsgaard (1992) 91ff, 103.

73 Columella 7.2.1.

74 Varro 2.4.3.

75 MacKinnon (2001) 656.

76 Frayn (1979) 39, observed that, 'where the peasant is depicted as consuming any meat at all, it is usually bacon or pork.' Cf. White (1970) 316. Recent archaeological surveys point out the importance of pigs on the Roman sites, though not necessarily on peasant farms. Small (1981) 211; Barker (1985) 13f; Barnish (1987) 159ff; Small (1991) 212; Gualtieri (1993) 334f. On pigs in Greek agriculture, Jameson (1988) 99; Isager and Skydsgaard (1992) 93, 103.

77 Dio Chrys., *Or.* 7.74.

Recent analysis has shown that, at least in Italy, there were two kinds of domesticated pig: a smaller boar-like swine and a larger, fatter kind of pig. The first was kept in herds and pastured in forests, the latter was kept in smaller numbers and stall-fed. Stall-feeding included organic waste of the farm.⁷⁸ Dio's rustics slaughtered the pig at the son's and daughter's wedding, not only in order to provide a sacrificial animal for the occasion, but also to have meat on the table. The father did not seem to mind that the pig had been lavishly fed on barley. It might have been a good year – in bad years, the pig would have been slaughtered earlier. Temporary surplus of resources was thus converted into more permanent forms of reserve. Moreover, livestock offered food or income in the pre-harvest period.

Most importantly, sheep, goats or pigs hardly competed with the people for their sustenance. As far as livestock required land that could be used for arable farming, smallholders probably preferred to use their good arable land for growing crops for people rather than using it to sustain livestock. Although we have seen in the [previous chapter](#) that integration of arable farming and livestock holding solved the problem of shortage of natural pasturage and of manure, we may doubt whether this pertains to poor cultivators as much as to the landowners for whom Varro and Columella wrote their manuals.⁷⁹ Most ancient smallholders probably resembled Dio's rustics, who only kept one cow, besides a few goats and a pig.⁸⁰ Rather, smallholders held livestock in order to make use of those parts of the lands that were not suited to arable farming. Sheep and goats can survive on pasture, while pigs can eat refuse, and products of the wild normally not eaten by people. Early medieval pigs were small and half-wild, like the smaller kind of Roman times, being fed in woods and only kept at the farm for short periods.⁸¹ Thus the shortage of land or the lack of capital was no obstacle to keeping a few goats, sheep or pigs, provided there was access to pasture land and woods.⁸² Even stronger: in view of the shortage of arable, for many smallholders the exploitation of marginal land was a necessary element of their subsistence strategy.⁸³

78 MacKinnon (2001) 656ff.

79 Lirb (1993) 263f, 272 stresses the mitigating factors in the competition between men and their livestock, but admits that it could never be neutralised.

80 Dio Chrys., *Or.* 7.47.

81 Montanari (1999) 170.

82 As Barker and Grant (1991) 77, point out, 'the cost of raising the flocks is kept very low by exploiting land for grazing that is relatively unproductive and remote or during a period when the agricultural land is fallow.' Sheep kept in stalls during part of the year required hay and other food supplements. Similar, Osborne (1987) 47; Alcock *et al.* (1994) 151f.

83 On the various types of environmental 'marginality' and their uses, see Horden and Purcell (2000) 178ff, 197ff.

In general, the care of the animals and the processing of meat, wool or cheese offered profitable employment for at least some labour throughout the year.⁸⁴ Besides, livestock was flexible in the sense that the animals could be sold or eaten when the labour requirement was felt to be a burden.⁸⁵

Summary

Since land and capital were fixed at a low level for most smallholders, labour constituted the only flexible means of production. According to neo-classical theory, peasants should have avoided putting much labour into their small farms, because this resulted in low labour productivity. However, at peak times – especially in early summer – the cultivation of the farm required many hands to share in the workload, gathering the ripe crop before storm, rain, pest or thieves could harm the harvest on which the household's survival ultimately depended. Moreover, many peasant families were faced by a shortage of land. Migration, urban employment or long-term recruitment could alleviate land-hunger only to a limited degree. Peasant households tended to be large, because the shortage of land and other resources forced relatives to co-operate. Economic co-operation did not always lead to co-residence, but in regions of dispersed settlement, it often did. Large, complex households not only divided available resources among more people; they also provided more stability in the balance between workers and consumers, and between the household and their land. Hence, the input of family labour in peasant farming was generally large. However, these many hands ideally had to be employed in a profitable way throughout the year. Diversification of crops and fragmentation of landholdings were strategies used to lower the peak demand for labour on the farm. The growing of labour-intensive crops like vines and the holding of livestock constituted ways of increasing the workload throughout the year. Nevertheless, the freedom of peasants to employ strategies that were aimed at avoiding low labour productivity was limited. Specialisation in labour-intensive crops reduced the land available for food crops and forced them to rely on the vagaries of the market. Their lack of capital and the small scale of their agricultural

84 However, Simpson (1995) 40 points out that the low number of animals that could be sustained under the dry conditions of Spain contributed to the high level of rural underemployment in the early modern era.

85 Hodkinson (1988) 60f; Horden and Purcell (2000) 199.

enterprises increased the risks of specialisation. Hence, many peasants were by necessity underemployed on their mixed cereal- and legume-based farms.⁸⁶ However, one important element we have almost ignored: the opportunities provided by the wider economy to offer meaningful employment of labour outside the farm. This will be the subject of the [next section](#).

ALTERNATIVE STRATEGIES

We return to Dio Chrysostom's rustic families in Euboea. The two fathers, whose tale is told by the son of one of them, originally had worked as hired herdsmen, tending the cattle of a wealthy, local land-owner, but also holding a small plot of land on the side. These men had families to take care of when the death of the cattle-owner and the subsequent confiscation of his possessions made them unemployed, as we learn from the words of the speaker, who was a boy at the time.⁸⁷ They settled at the place of the herdsmen's summer camp, which was in the hills, not in the plain.

Now our fathers remained in the huts at that time, hoping to hire out or find some work, and they lived on the produce of a very small piece of land which they happened to have under cultivation near the cattle-yard. This was quite enough for them as it was well manured. And having nothing more to do with cattle they turned to hunting.⁸⁸

Then when winter came on, there was no work in sight for the men whether they came down to town or to a village. So after making their huts tighter and the yard fence closer, they managed to get along and worked the whole of that plot, and the winter hunting proved easier.⁸⁹

The above passages elicit a few observations. First, while the two heads of the families were engaged in cattle-herding, the brunt of the work on the piece of land must have been undertaken by their wives and children, although we learn nothing directly about their activities. After the men had lost their job, the plots were too tiny to engage the two men full-time as well, who therefore had the time to hunt deer and boar in the surrounding hills. The lack of adequate employment on tiny farms was

⁸⁶ The use of the term 'underemployment' in relation to peasant societies has been criticised, as the term should be limited to commercial societies. See Seavoy (1986) 359. However, the term is commonly used in the sense of 'underutilisation of labour capacity', and in that sense I use it too. See also Evans (1980) 137; Skydsgaard (1980) 70; Rathbone (1981) 15, 19; Finley (1985) 106.

⁸⁷ Dio Chrys. *Or.* 7.12, 21.

⁸⁸ *Ibid.* 7.15–16.

⁸⁹ *Ibid.* 7.18.

an important factor contributing to the gender division of labour in peasant households. We shall return to this subject shortly.

Secondly, although their arable farming offered no full employment, the exploitation of this small, but well-manured, intensively cultivated piece of land seems to have been the prime source of the household's subsistence. The hunting must have supplemented their diet and replaced the cattle they now lacked, but they lived, as Dio Chrysostom says, on the produce of the land. In early modern Europe, agriculture often sustained a peasant household, while alternative strategies merely supplemented their income.

Thirdly, wage-labour seems to have been an ephemeral phenomenon in the ancient countryside.⁹⁰ This was not because wage-labour was rejected as degrading – only the wealthy could afford such a luxury. Elite contempt for wage-labour and the concentration of people like Varro and Columella on slaves on the villa may lead us to underestimate the importance of wage-labour in general.⁹¹ In reality, much work was performed for wages.⁹² The steady stream of migrants seeking paid labour in the city of Rome suggests that the common people happily accepted employment for wages.⁹³ Although the agricultural writers refer to wage-labour for particular tasks and peak labour, they do not mention wage-earners among the permanent staff of the estate. Wage-labourers have little place in Varro's or Columella's descriptions of agricultural estates, beyond the observation that human labour was either servile or free, the latter consisting of small farmers, wage-earners (*mercenarii*) and debt-bondsmen (*obaerarii*).⁹⁴ However, outside Varro's and Columella's

90 More optimistic seems Alcock (1993) 108ff, who assumes that the growth of large estates and the increase of taxation and rent in cash in Roman times forced the class of smallholders in Greece to rely increasingly on non-agricultural work.

91 Scheidel (1989) 139 argues that Columella was not as averse to wage-labour as is often assumed, but his examples are limited to temporary tasks and peak labour. Also Varro 1.16.4 shows that sometimes outside labour was employed, in particular specialists and artisans. See Kudlien (1984) 66ff.

92 See for instance the brief survey of wage labour in various sectors in Banaji (2001) 201ff. Wage-labour in Egypt: Rowlandson (1996) 205ff.

93 Thus Morley (1996) 127. Aldrete and Mattingly (1999) 201 for instance estimate that thousands among the urban plebs found employment in the handling of imports and their transportation to Rome. Also Galsterer (1990) 37ff; Pleket (1993a) 19f. See Sirks (1991a) 252ff for a detailed analysis of the handling of cargo in Ostia/Portus, along the Tiber and in Rome.

94 Varro 1.17.2. Garnsey (1980b) 35f rightly points out that the predominance of slavery may not have been as widespread as sometimes is assumed. Elsewhere, freemen may have worked as a permanent labour force on large properties. Recently, Garnsey (2002) 703. Also, Pleket (1990) 95f. Whittaker (1980) 77ff shows that slavery was not widespread in Africa, Gaul and Asia, where many pre-Roman forms of dependence continued to exist in Roman times.

estates, agricultural wage-labour may have been quite common. A parallel to Dio Chrysostom's non-servile and wage-labouring herdsmen is provided by an Egyptian swineherd, who protests that he is owed four months' wages.⁹⁵ However, many rural employment opportunities were short-lived and seasonal, as the following example from fourth-century BC Greece also shows:

The troops on the island of Chios under Eteonicus subsisted, so long as the summer lasted, upon the produce of the season and by working for hire up and down the island. When winter came on, however, and they were without food and poorly clad and unshod, they got together and agreed to make an attack upon the town of Chios.⁹⁶

Xenophon did not even deem it necessary to explain that no work was to be found in winter, since to his readers this was self-evident. In a world so much dominated by the weather and by the time of year, by the growth cycle of the crops in the field, and by the seasons of travel and transport by sea and land, economic life expanded and contracted in a regular annual cycle. The opportunities for members of rural households to find employment outside their farm have to be seen within this seasonal regime.⁹⁷

Agriculture and employment

The inevitable reliance on agriculture for most of the rural households is the main characteristic of the peasantry, in contrast to market-orientated farmers or the rural proletariat. The peasant household functioned as a productive unit that was centred on the land, on the production of which it depended for survival; alternative strategies were employed in the – often considerable – margins of their peasant farm. This distinguished them from market-orientated family farmers, who have been characterised as an 'entrepreneurial unit', and from the rural proletariat, who were not a productive unit in any economic sense, but rather a 'bundle' of individual survival strategies (often including tiny garden plots). Admittedly, the distinction between a peasant class and a rural proletariat is a matter of degree. Nevertheless, the distinction between peasants who performed non-agricultural labour as a non-essential, supplementary strategy, and

95 P.Lond. 2007. Bowman (1986) 105.

96 Xenophon, *Hell.* 2.1.1.

97 On seasonality of employment and rural income in modern Third World countries, see Alderman and Sahn (1989).

full-time wage-earners has important implications for our understanding of the role of non-agricultural labour in the rural economy.

Egyptian papyri offer some evidence of the diverse strategies employed by the 'family units' of the rural poor, which, apart from working the land, included casual wage-labour, petty retailing, fishing and crafts.⁹⁸ Dio remains silent on the work the two unemployed herdsmen 'hoped' to find, though the remark that at the outset of winter, no employment was to be found in village or town implies that previously there had been work. As Dio shows, there was not enough employment for many people to be sustained by offering their labour for a wage. One should not confuse labour with employment. Unlike nineteenth-century industrial Europe or the modern Third World, where industry offers non-agricultural employment throughout the year – though the pay is bad and work insecure – the economy of the ancient world offered few rural employment opportunities.⁹⁹ Hence, in antiquity, a rural proletariat cannot have been numerous in many rural regions. While wage-earners were undoubtedly employed on slave-run villas, the predominance of slave-labour on commercial farms in most of Italy and some other parts of the Mediterranean world precluded the existence of a large landless class of agricultural wage-labourers of the kind that found employment on the *latifundia* of early modern southern Spain or Italy.¹⁰⁰

Ironically, agriculture offered most employment, but at a time when peasants had least labour to spare.¹⁰¹ As far as our agricultural manuals indicate, wage-labour in arable farming consisted primarily of day-labour at the grain harvest and vintage.¹⁰² The slave-run villas were not less subjected to seasonal fluctuations in their labour demand than the farms of the peasants and small farmers. In order to reduce the servile farmhands

98 Rathbone (1991) 393.

99 Wild (1999) 29, points out that 'in the north-west provinces there can have been comparatively few full-time professional craftsmen.' The same holds true for most of the ancient rural world. Thus also Finley (1985) 107. Comparative evidence may point to wrong conclusions. Cynthia Patterson (1985) 117f, for instance, presupposes an insatiable demand for labour, when discussing possible motives in ancient Greece to expose or kill infants. She argues that poverty was no reason for Greek families to practise infanticide. Children, she argues, were not expensive to raise, because 'food and clothing were the primary expenses; these were generally simple and might be produced at home [?!]. Although completely destitute persons might not raise a child, for a "poor" working man the cost of rearing a child could be less significant than the economic value of his (her) labor, once he (she) was out of early childhood.'

100 Ruiz (1998) 64: 'By the eighteenth century, the number of *jornaleros*, a truly rural proletariat, surpassed 75% of the peasant population.' Simpson (1995) 44.

101 For a similar situation in Third World countries, Messer (1989) 163.

102 Varro 1.17.2. An inscription from Pompeii mentions a group of *vindemitores* (CIL IV 6672). See also Evans (1980) 136f; Skydsgaard (1980) 65ff.

to a level they could employ fully throughout the year, wealthy land-owners and market-orientated farmers employed day-labourers at peak times, such as during the harvest period.¹⁰³ Generally, day-labourers came from the vicinity of the estate. Cato, for instance, advises potential buyers of estates to pay attention to the available labour in the area.¹⁰⁴ Not all day-labourers were peasants; some harvesters came from towns; others were part of the rural proletariat.

The opportunity for smallholders to perform day-labour at harvest-time on the estates of their wealthy neighbours was limited by the labour demand on their own farms.¹⁰⁵ Peasants would not work as day-labourers on commercial farms if this would be detrimental to their own farm.¹⁰⁶ Suetonius mentions 'Umbrian labourers who cross the Po every summer to help the Sabines with their harvest'.¹⁰⁷ The reason that day-labourers were brought in from elsewhere may have been that in these regions the harvest was earlier or later, so that their temporary work as harvesters was not in conflict with the labour demand of the day-labourers' own farms.¹⁰⁸ Moreover, in some regions, commercial farming may have replaced peasant farming to such a degree that there were few rural households seeking additional employment. At other times of the year, the vintage or haymaking offered opportunities for peasants to employ their superfluous labour capacity and to supplement their income. Columella, for instance, advised the cultivation of different types of vine, in order to lessen the peak in labour demand.¹⁰⁹ In general, day-labour on commercial farms was to the mutual advantage of peasants and the wealthy farmers and landowners.

Agriculture was a residual employer; in other words, the majority of the population could not find employment outside agriculture – or only temporarily – and thus had to fall back on working the land.¹¹⁰ Hence, most households had little choice but to employ many hands on their

103 Garnsey (1980b) 36, also 41f; Evans (1980) 136; Skydsgaard (1980) 66ff; Rathbone (1981) 12ff; De Neeve (1984) 21; Scheidel (1989) 140; Rosafio (1994) 147, 152. Cf. Scheidel (1989) 144, on the employment of seasonal labourers during the vintage.

104 Cato, *de agri cult.* 1.1.3. See also Scheidel (1989) 139.

105 Scheidel (1989) 141, who refers to Columella 2.2.12.

106 Cf. Mendels (1972) 242 on the paradox of the shortage of harvest labour even in areas experiencing population pressure.

107 Suetonius, *Vesp.* 1.

108 Cf. Garnsey (1980b) 42; Skydsgaard (1980) 69; Spurr (1986) 66; Dyson (1992) 135; Lirb (1993) 285.

109 Columella 3.21.9f. Cf. Rosafio (1994) 149.

110 Thus regarding Spain, Simpson (1995) 62. Cf. Phillips (1979) 50.

farms, resulting in underemployment and low labour productivity. The wider economy offered no stimulus to change the labour-intensive ways on peasant farms. The economy offered insufficient employment outside agriculture to reduce labour input in agriculture and thus failed to raise labour productivity.

However, it was precisely the low labour productivity in agriculture that stimulated the employment of labour in other sectors of the economy. Because the output of much additional (i.e. marginal) work that could be undertaken on the farm was low or even negligible, there was a low threshold to substitute this work by employment outside the farm, however insecure or badly paid. Alternatively, one could decide not to work: underemployment resulted in not working at all for part of the time. Hence, contrary to the widespread assumption that the poorest have to work the hardest, the poor might have had much time to spare. (One wonders what implications this might have for the general assumption that the smallholders in Attica and the poor labourers of Athens had little time to participate in democracy.) Our well-known rustics from Euboea may have spent much time hunting, not because it was so profitable, but because there was no more lucrative alternative.

In this regard, the economic history of early modern Europe has produced the concept of the externalisation of labour costs, which means that agriculture bears the reproductive costs of such labour as is deployed outside the primary economic niche, but is still primarily based on agriculture.¹¹¹ To clarify this by a simplified example: a peasant household makes a living by working on their small farm. Their reproductive costs – i.e. their requirements to stay alive to till the soil and perform other kinds of labour – are borne by their agricultural labour. For various reasons, part of their labour potential is deployed outside their farm, for instance in burning charcoal on those days when their labour cannot be usefully deployed in the field, or in producing textiles for the local market by those members of the household whose labour potential exceeds the labour requirement of their small farm. The substitution threshold for their labour is low. The income of their supplementary employment, whether in goods or money, easily exceeds the output of the alternative, marginal work on the farm. Their farm would not produce more if they did not

111 The implications of the concept of externalisation of reproductive costs for the Roman world have been dealt with in more detail in Erdkamp (1999). See also Mendels (1972) 241–61; Medick (1976); Kriedte (1980); Belfanti (1993) 253–80.

deploy this labour outside their farm. Hence, external labour was cheap, because it could be paid below its reproductive costs.

The concept need not necessarily apply to wage-labour. Peasants could be self-employed, using the means of their farm in outside labour. Not only human, but also animal labour in agriculture was of seasonal character. Moreover, the post-harvest period was the time of year when most goods had to be transported, which gave farmers the opportunity to employ their animals and themselves in the movement of agricultural and other goods. Part of this was the farmers' own surplus production; part of it involved the transportation of goods in wider trade channels. Spanish farmers travelled to neighbouring regions to exchange their own surplus of corn for wine or olive oil. Some farmers would periodically transport charcoal or other rural products to a town of their region in order to sell it.¹¹² The sources on Talmudic Palestine offer a clear example of peasants engaging in transport and trade as a secondary activity:

It once happened that a certain town had no salt, and there was a band of donkey-drivers who said: We will go to such and such a place and buy salt, and sell it before others come. Now, they had a leader, and they said to him: Let us go to this place . . . He answered them: I have to plough tomorrow, so wait till I have done my ploughing, and afterwards we will go.¹¹³

Interestingly, the donkey-drivers in this story have structured their activities in some kind of organisation.¹¹⁴ The main impetus to form some kind of corporation may have been that their combined financial means offered them better opportunities to profit from current market conditions. Many muleteers and itinerant traders mentioned in the sources may have been peasants who supplemented their income between agricultural activities by engaging in the small-scale trade of their own crops and other commodities.

The availability of labour in the countryside may partly explain the degree to which ceramics and other manufactured goods were produced in the countryside rather than in cities.¹¹⁵ The Roman world provides ample evidence of owners of estates who exploited other resources from their land, which were not directly related to farming. For instance, some estates included claybeds, which were used in the production of

112 Examples given by Ringrose (1970) 50f and Braudel (1982) 327f. Cf. Phillips (1979) 54. Some of the muleteers would make an annual trip to Madrid or a large seaport. Most of them operated within a range of 80 to 120km (*ibid.* 73).

113 Midrash Psalms 12.1, ed. Buber pp. 104f. Quoted from Sperber (1998) 17.

114 Sperber (*ibid.*) even translates 'guild' of donkey-drivers.

115 Erdkamp (1999) 570.

amphorae, bricks and tiles. Landowners probably employed slave-labour in producing amphorae, in which they sold part of their estate's produce like wine or olive oil, or they manufactured bricks and tiles for the local market. The location of potteries in the provinces has led to the conclusion 'that these industries were seasonal and run by those involved in agriculture'.¹¹⁶ Though lacking the capital for large investments in industry, peasants and small farmers could also employ part of their labour in processing raw materials and manufacturing goods.

If households could bundle enough of such work, or the income from such employment was high, they could become detached from agriculture. The rural world did indeed include professional smiths or carpenters, full-time muleteers and the like. Varro, for instance, points out that farmers 'prefer to have in their neighbourhood men whose services they can call upon under a yearly contract – physicians, fullers, and other artisans – rather than to have such men of their own on the farm.' However, he explicitly says that this only applies 'if there are towns or villages in the neighbourhood'.¹¹⁷ If the alternative strategy became sufficiently attractive, a peasant could turn into a full-time trader or artisan.¹¹⁸ In that case, the concept of externalisation of costs would no longer be relevant. In reality, the households of many such labourers or artisans combined non-agricultural employment with some agricultural work, thus partially sustaining this labour by working the land. In this regard, ancient evidence will always be inadequate, but we know that at least in Roman Egypt, land was owned or even leased by people whose official occupation was non-agricultural.¹¹⁹

However, peasants would only offer their labour when the agricultural season allowed. While they were cheap at the right season, they would not transport goods even for high wages when their labour was needed on the field. Neo-classical considerations of profit-maximisation do not apply in any simple form anymore. In the words of A. Knotter: 'The members of the family cannot choose their jobs at random by measuring earning differentials or opportunity costs only, as they would do according to neo-classical economic theory. They have to attune their labour among

116 Millet (1982) 428. Cf. Whittaker (1993) 112ff. On the location of such industries, also De Ligt (1991) 35ff.

117 Or wealthy estates – but Varro 1.16.3–4 will not have meant that estate-owners should have made contracts with their neighbour's smiths or fullers. See Kudlien (1984) 66ff.

118 As Kudlien (1984) 73ff points out, some of them were itinerant artisans, while others were settled. Varro's phrase *anniversarii vicini* refers to the latter group.

119 Sharp (1999a) 165, referring to BGU IX 1900, introd., p. 191.

themselves and to seasonal variations in labour demand in specific economic and ecological settings.¹²⁰ Although they would certainly try to maximise their profit, 'cost' or 'price' did not determine the transportation they undertook. As Ringrose emphasised in his study of transport in early modern Spain, such a vast amount of transport capacity was only offered because it was connected to agriculture; separated from the primary means of existence in agriculture, this cheap transport could not exist. As it was, peasants and small farmers provided a large part of short-, and even medium-distance transportation.¹²¹ The features of labour demand in peasant agriculture made manpower available to other sectors of the economy, not least in overland transport, at a cost below subsistence, thus diminishing the meaning of 'cost' and 'price' in this context.

Gender division of labour

Peasants employed alternative strategies in addition to their primary dependence on working the land, and it is highly likely that gender played an important role in the allocation of tasks within the rural households.¹²² However, the sources provide little evidence to analyse the gender division of labour in the ancient world.¹²³ Social values and practical considerations governed the division of work within rural society. The care for children, which was primarily the responsibility of women, may have compelled most women to do work near the house. However, it seems that social norms were more important than biological constraints in concentrating the work of women in the domestic sphere. In the family context, they were subjected to the social control of relatives and neighbours, which is not meant to imply that women only behaved when supervised, but that gossip was most easily avoided when the opportunity to misbehave or the chance of rape did not occur.¹²⁴ Therefore, work outside the domestic sphere and detached from the household seems to have been primarily undertaken by men. The outside world offered more

120 Knotter (1994) 35.

121 Ringrose (1970) 48ff. 'The conversion of such people to specialized transporters would have robbed farming of a large portion of its scarce animal power, destroyed the cost advantages inherent in the peasants' position as agriculturalists with periods of seasonal idleness, and disrupted the subsistence mechanisms of the countryside' (*ibid.* 122).

122 In general, see Ellis (1988) 166ff.

123 On the rationalisation of the different tasks of men and women in Greek literature, see Scheidel (1990) 407f.

124 Similarly, Van Minnen (1998) 203 argues that women learned a trade at home because 'that was safer'.

opportunities for external employment to men than to women. This is not to say that female labour did not play an important role, but it did so largely in agriculture and in the context of the household. Female labour outside the household was either performed by slaves, or it was regarded as indecent.¹²⁵ Egypt has provided some evidence of craftswomen in the form of apprenticeship contracts. Two elements are noticeable: first, apprenticeship contracts for freeborn women are few in number compared to those for men (3 against 28); secondly, crafts were mostly practised in the domestic sphere.¹²⁶ An important strategy employed by early modern households, sending away young daughters to perform domestic labour for wealthy families, was not an option open to ancient households, since this was precluded by the dominance of slave labour in the domestic sector.¹²⁷

While physical strength is an important factor in the allocation of agricultural work, comparison with other societies makes clear that women in principle are able to undertake all the work in agriculture.¹²⁸ In some societies, even the physically most strenuous work in the field is done by women. The question remains in what way the redundancy of labour on peasant farms and the use of external employment strategies influenced the work performed by women in peasant households.¹²⁹ W. Scheidel observed that few farmers in the ancient world were sufficiently prosperous to deny themselves the labour of the female members of their household on their farm.¹³⁰ However, that seems to be beside the

125 See also Treggiari (1979) 65ff, who concludes: 'The attested range of women's jobs is much narrower than that of men' (p. 78). On female labour in times of war, Evans (1991) 114ff.

126 Van Minnen (1998) 201ff.

127 Saller and Kertzer (1991) 9f point out that values of honour and shame precluded an important role of such service. Cf. Watts (1984) 51ff; Reher (1990) 201ff; Barbagli and Kertzer (1990) 381; Barbagli (1991) 255f. Roeck (1991) 454 shows that women were less mobile than men.

128 On ancient attitudes, Scheidel (1990) 424ff; (1996) 5ff; Sallares (1991) 83; Osborne (1987) 70. While in modern southern Italy it was improper for women to work outside the house, in northern Italy women played a crucial role in the labour force, Kertzer and Brettell (1987) 95. Caiati (1984) 120, however, observes that cereal cultivation was the responsibility of adult males in early modern Tuscany. Cf. the role of women in agriculture mainly as day-labourers in early modern Languedoc, E. Le Roy Ladurie (1974) 108ff. On the gender-specific division of peasant-labour, also Knotter (1994) 34f.

129 The lack of sources would make historical parallels important. Unfortunately, there is little literature available, except on modern Third World countries. However, see Le Roy Ladurie (1974) 125ff; Seavoy (1986) 20. Emigh (2000) 117–37 compares the subsistence strategies of 15th-century male and female single-person households (predominantly widowers and widows) to analyse the division of labour in rural society. However, it is very problematic to apply the conclusions based on single-person households to the division of labour within multi-person households.

130 Scheidel (1990) 408.

point. In view of the seasonal and structural underemployment on peasant farms, there was ample scope to do without the work of the women on the land – except at the most pressed times of the year, for instance during harvest or vintage. Let us look at the evidence on the basis of Scheidel's comprehensive survey. We meet women engaged in agricultural work primarily in relation to the harvest. Women occur as harvesters, engaged in cutting grain and hay, or as reapers, gathering the stalks from the field. Women also occur engaged in threshing and the gathering of the grape harvest.¹³¹ In addition, Scheidel offers a few passages concerning female day-labourers in ancient Greece.¹³²

So far, we see women mostly participating in agriculture in the context of peak labour demand: harvest, threshing and vintage. The Egyptian papyri contain few women who leased private or public land, although they frequently appear as owners of land. This may indicate that women were not directly concerned with agricultural work.¹³³ General employment of women in agriculture is implied in the following passage from Columella: '... on rainy days or when, owing to cold or frost, a woman cannot be busy with field-work under the open sky ...'¹³⁴ However, this passage relates to female slaves, not members of free households. A papyrus from AD 99 contains the contract of an unmarried Egyptian woman of 26, who agrees to work at an olive press for the same daily wage as the other olive carriers in the village.¹³⁵

The evidence seems to show women engaged in agriculture at times of peak demand, either on their own farm or while performing wage-labour. Admittedly, this was probably not their only contribution. The dwellers of the countryside generally appear in our sources only in so far as they relate to the estates of the rich. This is even truer of women, who therefore appear in the works of the agronomists only as day-labourers or as slaves. The sources remain silent on the work performed on peasant farms, which rules out any argument from silence. The fact that men more easily engaged in work outside the farm may at certain times of the year have given the women within the household an important role in cultivating the fields.¹³⁶ Patterns of settlement are undoubtedly of importance in this

¹³¹ *Ibid.* 416ff. ¹³² *Ibid.* 424 n. 89.

¹³³ Rowlandson (1996) 263; (1999) 154. On the other hand, those women that do appear as lessees of land need not have been directly involved in agriculture.

¹³⁴ Columella 12.3.6.

¹³⁵ P.Fay. 91 = Rowlandson (1998) 231f. Rowlandson refers to girls employed in the task of winnowing in P.Fay. 92.

¹³⁶ Thus Ellis (1988) 136, who refers to case-studies in southern Africa. Cf. *ibid.* 171f.

regard, as isolated farmsteads offered women more opportunity to work on the fields than households concentrated in nucleated settlements. In view of the social norms in ancient society, it seems safe to assume that men worked the more distant plots and performed the physically hardest work, such as ploughing, perhaps in the company of their wives and daughters, but it is unlikely that these tended isolated plots on their own. The social norms probably assigned women a role in tending the intensively cultivated garden plots, whose nearness to the house avoided conflict with the rules of decency.¹³⁷ In general, the allocation of tasks on the farm probably gave female members of the household much opportunity to employ their labour outside farming, mostly so at agriculturally slack periods.

Women's work: rural textile industry

Rural female labour may have had an important role in textile production in Roman times. Two considerations make such involvement very likely. First, though lacking the capital for large investments in industry, peasants and small farmers could employ part of their labour in processing such rurally produced materials as wool or flax.¹³⁸ Secondly, domestic textile work offered peasant women a socially acceptable opportunity to employ their labour in a domain that traditionally belonged to women.

In the ancient sources, spinning and weaving were typically among the duties of women.¹³⁹ The Jewish Mishnah includes 'working in wool' among the seven basic duties of a woman.¹⁴⁰ Moreover, women are explicitly mentioned as the sellers of woollen and linen garments in Hellenistic and Roman Palestine.¹⁴¹ Pausanias has a fascinating passage on textile production in the northern Peloponnesian harbour town of Patrae:

¹³⁷ Thus Osborne (1987) 53, who points out that in Classical Greece, settlement, agriculture and social structure were bound up one with another. Referring to anthropological studies, he points out that on isolated farms, women could more easily work the land, while social control in villages and hamlets rules out their participation (p. 70). Cf. Scheidel (1990) 425f.

¹³⁸ In comparison, Epstein (1992) 295 relates the silk industry in medieval Sicily to the gender division of labour and seasonal underemployment in agriculture. Wild (1999) 31 points out that 'linen production fits easily into the seasonal agricultural cycle.'

¹³⁹ Grassl (1982) 112ff gives a number of passages that demonstrate the role of textile work as a source of income to women. Cf. Jones (1974c) 351, 360; Pomeroy (1975) 199f; Treggiari (1979) 67ff; Wild (1999) 33.

¹⁴⁰ Hamel (1990) 112. Cf. Ben David (1974) 151.

¹⁴¹ Ben David (1974) 145.

The women of Patrae outnumber the men by two to one. These women are amongst the most charming in the world. Most of them gain a livelihood from the fine flax that grows in Elis, weaving from it nets for the head as well as dresses.¹⁴²

There may be two plausible explanations for the imbalance between the sexes in Patrae, which are not mutually exclusive. Firstly, the employment opportunities offered to women in (or near) this town, which apparently was a local centre for textile production, may have attracted female labour from the surrounding countryside or from neighbouring regions. Secondly, the large degree of male employment in shipping may have resulted in fewer adult men in Patrae, not unlike many coastal villages in early modern times. In the first case, it would be a rare instance of independent female labour and migration. Interestingly, a labour-intensive textile industry is also attested in this region in the ninth century AD.¹⁴³

Admittedly, there is hardly any evidence relating to peasant households that substantiates the hypothesis about the role of female peasant labour in the textile industry, but instead we have ample evidence of the importance of women workers in textile production on the estates of the rich. For instance, during a discussion of the activities that are to be regarded as part of arable farming, Varro dismisses the idea that animal husbandry is part of it, using the following argument:

The error lies in the assumption that, because cattle can be kept on the land and be a source of profit there, they are part of agriculture. It does not follow, for by that reasoning we should have to embrace other things quite foreign to agriculture, as, for instance, you might keep on your farm a number of spinners, weavers and other artisans.¹⁴⁴

This passage in Varro shows that weaving occurred on the estates of the rich, but that it was regarded as a separate enterprise to farming. However, according to the same argument, animal husbandry too should not be seen as essentially belonging to arable farming. In reality, arable farming and animal husbandry were indissolubly connected on the estates of large landowners. The jurists considered the similar problem of whether the slaves and equipment engaged in textile production had to be considered as part of a bequeathed estate.

142 Pausanias 7.21.14. Cf. Alcock (1993) 80; Horden and Purcell (2000) 352f.

143 On the textile industry in Naupaktos (on the other side of the Gulf of Corinth from Patrae), McCormick (2001) 535.

144 Varro 1.2.21. Cf. Wild (1999) 29.

A man legated to his wife the farm, as *instructus*, on which he himself lived. When consulted as to whether the wool-working women were included in the *instrumentum*, he replied that they were not indeed part of the *instrumentum* of the farm, but since the head of the household, who made the legacy, himself lived on that farm, it should not be doubted that the slave women and other things, with which the head of the household was equipped on that farm, all appeared to have been legated.¹⁴⁵

Roman law distinguished the legacy of a *fundus cum instrumento* from that of a *fundus instructus*. The first is defined as the legacy of an estate including the equipment, livestock and slaves that were needed to produce a crop. The *fundus instructus* also included the slaves and furnishings that were not essential to the estate as a productive unit, but had been part of the estate as a place of dwelling for the owner. In the above case, the wool-workers were considered not to be part of the legacy as a *fundus cum instrumento*, but they were part of the legacy as *fundus instructus*. In another passage from the *Digest*, it is also ruled that 'the wool-workers who provide for the clothing of the workforce' were to be considered an integral part of the estate.¹⁴⁶ Both passages in the *Digest* solely refer to female textile workers, while the latter passage assumes that the prime task of these women was to take care of the clothing of the estate's servile workforce. Both the role of women and the self-sufficient nature of textile production are confirmed by Columella in a fragmentary passage that we have partly seen above:

But in order that she may have recourse to wool-work on rainy days or when – owing to cold or frost – a woman cannot be busy with field-work under the open sky, there should be wool prepared and combed out ready, so that she may be able more easily to carry out the task of spinning and demand this work also from others. For it will not be a bad plan if clothing is made at home for herself and the overseers and other slaves of good position, so that the account of the master of the house may be less heavily charged.¹⁴⁷

Implements used by women for wool-processing are reckoned by Columella among the items regularly used on a farm.¹⁴⁸ Interestingly, according to Columella, the women engaged in the production of clothing normally also worked in the fields. It was only when bad weather made this impossible that their labour was deployed in textile production. It is unclear whether the female wool-workers on the estates in the legal

145 Alfenus *Digest* 33.7.16.2.

146 Ulpianus *Digest* 33.7.12.5.

147 Columella 12.3.6. Cf. Wild (1999) 29.

148 Columella 12.3.1. Cf. Wilson (1990) 193: 'Numerous loom-weights from both urban and rural sites point to weaving as a common household industry.'

sources that we have just seen also worked on the fields. However, the seasonal fluctuations in labour demand on the villa make this a likely assumption.

If estate-owners wanted to save money by having their female slaves produce cheap clothing for the workforce on rainy days, it is reasonable to assume that the women of peasant households also engaged in textile production when they were not working the fields. It is difficult to say whether they also produced for the market. Apuleius' *Metamorphoses* mentions a poor woman, who had to toil night and day on processing wool in order to earn a little money.¹⁴⁹ There is some evidence for women producing textiles on piece-wages, albeit in an urban context and not a rural one. A graffito from Pompeii contains the names of six women, each followed by a brief indication of their produce, for instance *Amaryllis pensa V trama et stamen*, which is probably to be interpreted as five days' worth of spinning-wool, one woven cloth and a woollen headband.¹⁵⁰ The Greek and other non-Roman names of some of these women seem to indicate a servile background, which does not point to rural households in Pompeii's hinterland.¹⁵¹ However, in early modern Europe, such putting-out work was often undertaken by women of peasant households, because they were cheaper than urban workers.¹⁵² There is no reason to deny the possibility of such a system in the Roman world.¹⁵³

The extent of a rural market for plain garments – or, for that matter, other plain items such as tools, rope and furniture – remains unknown, but the rural population and the people in nearby towns must have constituted a significant market for simple goods, for which labour cost

149 Apuleius, *Metam.* 9.5.

150 CIL IV 1507. See also Moeller (1976) 40, 77f; Jongman (1988) 164f. Throughout Italy, inscriptions mention various workers who were involved in the processing of wool. See Frayn (1984) 148ff.

151 Moeller (1976) 102f.

152 Likewise Jongman (1988) 162f. Cf. Kriedte (1980) 93ff; Belfanti (1993) 270; Epstein (1993) 466ff; Pellizon (2000) 93; Farr (2000) 49ff. On the putting out system, see also Braudel (1966) 430ff.

153 Wild (1999) 33: it was common 'to buy the raw fibres and then contract out the dyeing, spinning, weaving and fulling to operatives inside or outside the house'. According to Horden and Purcell (2000) 360, 'the home- and workshop-production of Italy and Egypt' was not significantly different from the textile production of early modern Europe. Jongman (2000a) 194 points out that 'there are virtually no epigraphic references to spinners and weavers or their collegia. Perhaps spinning and weaving were indeed still, at least in part, household activities.' Collegia of weavers are well known (see for instance Pleket [1998] 124ff), but as far as spinners are concerned, Jongman is probably right. Traditionally, the guilds were seen as the main difference from antiquity, but the gap between both worlds is narrowing with the realisation that the role of medieval guilds was much closer to that of their ancient counterparts than formerly believed. See Van Nijf (1997) 16f.

rather than quality was the most important factor.¹⁵⁴ The coarse wool of Liguria clothed the greater part of the households of the Italiotes, Strabo writes.¹⁵⁵ Apart from rural production of cheap clothing, however, there obviously was a textile industry for a wealthy market that could not be served by part-time labour of peasant women. In general, far more is known about the urban textile industry, probably catering for a wealthy market. A.H.M. Jones pointed out that, while we have some idea of urban production and the production of luxury cloth, the sources pay almost no attention to the processing of wool and flax, or to the rural production of cheap cloth.¹⁵⁶ Labour costs played less of a role in the manufacture of luxury goods.¹⁵⁷ Jones observed: 'The great weaving centres produced in the main luxury garments, the best of which cost twenty times as much as those made for the poorest classes.'¹⁵⁸ In the production of luxury textiles, skill, the importation of various raw materials of high quality and the availability of a market were conditions that were more important than saving labour costs.¹⁵⁹ As governor of Sicily, for instance, Verres located a workshop specialising in garments for women on the island of Malta, which location seems chosen with an eye to distant markets.¹⁶⁰ One may also think of the linen industry in Patrae and Tarsus.¹⁶¹ Generally, high-quality textile production may have been undertaken primarily by 'professional', urban textile-workers, some of whom may have been slaves. A differentiation between cheap clothing and luxury products may be required, the first offering part-time employment to peasant women, who were cheap because the reproductive costs were borne by agriculture.

154 Cato's ideal farmer would buy as little as possible; nevertheless he would purchase items such as clothes for the slaves, millstones, iron tools, and ropes on the market, which indicates a demand for such rurally produced goods (Cato, *de agri cult.* 22; 135). On the market in textiles, see Harris (2000) 724f. On the extent of a rural market for shoes, plain clothing, etc., Jones (1974a) 38ff; De Ligt (1993) 140, 146. See also Dyer (1989) 325 on peasant spending in medieval England: 'Despite their small surpluses, these quite poor people cumulatively generated a huge demand.'

155 Strabo 5.1.12.

156 Jones (1974c). Cf. Jongman (2000a) 188f. On the development of the terminology regarding textile workers, Petrikovits (1981) 69, 123f.

157 Jongman (2000a) 191f.

158 Jones (1974c) 353. Evans (1991) 121ff argues that, though the clothing industry offered employment for peasant women, these were increasingly confronted with competition from slaves and freedmen. Cf. Kriedte (1980) 97.

159 Likewise, Frayn (1984) 146.

160 Cicero, 2 *Verr.* 4.103.

161 Pausanias 21.14; Dio Chrys., *Or.* 34.21ff.

Summary

Our understanding of 'labour' in the Roman world should start from the realisation that the economy of antiquity was dominated by agriculture. Although not in neo-classical terms, the peasants in the Roman world were well aware of the low marginal productivity of much of their agricultural work, which was a result of the high input of labour on their small farms. Therefore, peasant families readily performed labour outside the direct cultivation of their farm. While the male members of the household hired out their labour in nearby villages or neighbouring estates, or performed services (for instance in transporting agricultural produce and other goods), domestic textile work offered peasant women a socially acceptable opportunity to employ their labour. However, the economy of most regions offered very little employment in antiquity, especially during the winter months. Peasant households put much labour into their farms, because there were few secure alternatives. Hence, the class of full-time wage earners – whether well-to-do artisans or wretched labourers – cannot have been large in most rural regions. The fact that peasant households were necessarily largely, if not fully, sustained by agriculture, made their superfluous labour cheap. The non-agricultural sectors of the economy were partly dependent on agriculture by (partially or entirely) transferring the reproductive costs of labour onto peasant farms.

HOUSEHOLD GOALS AND THE MARKET

The use of the term 'strategies' assumes that peasants had a 'goal', but so far, the latter has only been implied. The choice that smallholders faced between employing their labour on the land, looking for wage-labour, or not working at all was determined by the goals that they set themselves. Chayanov stressed that peasants, once their production had reached subsistence levels, preferred to avoid the 'drudgery' of additional labour rather than to use opportunities to supplement their income.¹⁶² Hence, in early modern Europe or Third World countries, the seemingly paradoxical phenomenon occurred that rising wages led to the withdrawal of labour from the labour market, since higher wages allowed reaching one's goal in fewer working hours. If Chayanov were right, this would mean that those peasants whose subsistence requirements were met would not

162 Even more strongly phrased by Seavoy (1986) 22. Cf. Ellis (1988) 109f.

seek additional employment, thus limiting the extent to which the concept of the externalisation of reproductive costs could apply.¹⁶³ However, the goal of peasants was not limited to minimal subsistence requirements. The minimal goal with which peasants were satisfied was culturally determined and was generally above physical subsistence requirements. Peasants profited from high wages or low living costs by not working at all only when the higher – culturally determined rather than biologically fixed – goal was achieved. It is within the margin between physical subsistence needs and cultural production goals that the externalisation of reproductive costs operates.

Subsistence – and a little bit more

Ellis rightly criticised the idea that households were a unit with a common goal, 'a supposition which requires pure altruism as a behavioural trait within the home'.¹⁶⁴ However, the ancient world does not allow any distinction between men or women, between the elderly and the young, within a household. Moreover, I believe that even if this were the case, it would not substantially alter what I have to say about household goals in the Roman world. Ideally, the ultimate goal of the household was its long-term existence, which required not only its subsistence on a day-to-day basis, but for the foreseeable future as well. For this reason, long-term subsistence was prized higher than short-term profit. In most rural societies, wage-labour only offered a very limited degree of security. In economies that were characterised by weak markets, nothing offered as much long-term food security as direct production. Therefore, the most direct way to achieve food security was to produce directly the food needed for one's household. 'Specialisation was constrained by the overriding concern for subsistence.'¹⁶⁵ In order to retain the security associated with direct production of food, many rural households tenaciously held on to a tiny plot (and still do so, for instance in modern Russia), despite general reliance on food and labour markets.

Beyond physical survival, households aimed at retaining their social existence, which means that households, even relatively poor ones, wanted

163 Cf. Osborne (1987) 194 who states that free labour was in limited supply in Classical Greece, because peasants had little desire to improve their economic position if it meant working harder.

164 Ellis (1988) 175.

165 Epstein (1998) 91 regarding early modern Italy. See Forbes (1989) 88f on the concerns of modern Greek peasants.

to preserve the status they had. In rural communities, well-to-do peasants had more status than marginal families who managed to scrape along. Status was expressed in consumption; 'social survival' therefore required continuation of consumption at a certain level, and social status had to be confirmed at community events such as weddings. Thomas Gallant provides an interesting analysis of the social importance of feasts and dinners on the basis of Theophrastus' caricatures of fourth-century BC Athenian types like the 'cheapskate' or the 'flatterer'. He notes that 'the household conducting the dinner was expected to play the major role. It was in fact placing on display its wealth and putting its collective prestige on the line.'¹⁶⁶ Even a marriage among Dio Chrysostom's sober-living rustics required a fattened pig and wine from the village. In Longus' novel *Daphnis and Chloe*, moderately wealthy farmers offered oxen, goats, sheep and corn as bridal gifts.¹⁶⁷ In Roman Palestine, a host who put many sorts of wine, meat and sweet cakes on the table earned the respect of his guests.¹⁶⁸ Hence, a household's production goal went beyond its biological requirements and included more or less luxurious consumption, the exact level of which depended on the customs of the community, the status the household possessed and the expectations that were raised in past years.

Status was related to community obligations, and the latter constituted another element to determine the household's production goals. See, for instance, the following passage, again from Dio Chrysostom's seventh discourse:

[One] daughter was married long ago and already has grown-up children. Her husband is a rich man living in a village. 'And do they help you when you need anything?' I enquired. 'We do not need anything', replied the wife, 'but they get game from us whenever we catch any, and fruit and vegetables, for they have no garden. Last year we borrowed some wheat just for seed, but we repaid them as soon as harvest time was come.' 'Tell me,' said I, 'do you intend to marry this girl also to a rich man that she too may lend you wheat?'¹⁶⁹

The last remark is acceptable as a joke, since the guest had already perceived that the girl in question was to be married to one of the multiple household's young men; it would not have been polite to allude to marriage directly as a strategy to ally one's family to a wealthier one, in order to achieve access to resources beyond one's own household. In this

166 Gallant (1991) 171f.

168 Hamel (1990) 29.

167 Longus, *Daphnis and Chloe* 3.29.4.

169 Dio Chrys., *Or.* 7.68f.

case, the well-to-do son-in-law provided seed-corn, though the mother-in-law was keen to stress the reciprocal nature of the material relationship. Gift exchange between households was so important and common that even Cato allows his *vilicus* to maintain such relationships with a few households: 'He must lend to no one seed-grain, fodder, spelt, wine or oil. He must have two or three households (*familiae*), no more, from whom he borrows and to whom he lends.'¹⁷⁰

Undoubtedly, kin and neighbours in the Roman world were obliged to offer assistance to households in need of food or seed. These relationships offered wealth when it was needed for expenditures beyond the means of a household. When direct production had failed, social strategies were crucial to diminish the threat to a household's survival by giving access to food. The absence of public or commercial institutions operating at the level of the rural masses to help cope with the hazards of food supply and general survival of the households gave the assistance of relatives and neighbours an important role in the social relations within rural communities. Through reciprocal relationships with kin and neighbours, resources were made available and the risk and hardship of individual households spread over several households. Connections with distant family, moreover, provided access to food when harvests had failed locally. Because of the element of reciprocity, households could ideally trust that help which was given, would one day be returned.¹⁷¹

Optimising peasants?

Household goals, therefore, went beyond subsistence, and, depending on the social position of the family, included a certain level of luxury and sufficient means to fulfil community obligations. These minimal goals did not rule out that the aim might have gone further than that. One may indeed ask the question to what degree smallholders were optimising farmers, rather than subsistence peasants.¹⁷² What role did product markets play in determining and fulfilling smallholders' goals? See for instance this passage from Columella:

170 Cato, *de agri cult.* 5.4.

171 'Interpersonal risk-buffering behavior', as he calls it, is discussed in detail by Gallant (1991) 143ff. Cf. Garnsey (1988) 56ff; Garnsey and Woolf (1989) 154ff; Halstead (1989) 73ff.

172 On the substantivist-formalist debate regarding the economy of peasant societies, see Hodges (1988) 9ff. Cf. Seavoy (1986) xi.

But when the harvest with ripe ears of corn grows yellow and when, passing the Twin Stars, Titan extends the day . . . garlic with onions join, and with the dill Ceres' blue poppy, and to market bring still fresh the close-packed bunches and, with wares all sold, to Fortune solemn praises sing, and to your garden home rejoicing go.¹⁷³

It is undeniable that ancient smallholders welcomed a profit, but to what extent was profit in itself a goal pursued by peasants in Roman times?¹⁷⁴

The market could be a means to achieve long-term food security. Therefore, could it not be argued that the best way to reach household goals was to make optimising use of the opportunities offered by the market? The medieval historian Fenoaltea reasoned that the best way to reach long-term food security would have been to optimise output. Diversity and fragmentation – so the argument goes – merely offered individual households a more stable share in a community's production. However, since these strategies did not influence overall production, they were not efficient in lowering risk. Hence, Fenoaltea concludes, these strategies existed for other reasons than risk-avoidance. Specialisation would have been more efficient, since it ensured an overall larger production. It allowed optimal adjustment of cropping strategies to conditions of soil, climate or markets, thus leading to higher output in terms of yield or monetary income. Cropping strategies that are traditionally perceived as risk-avoiding only served to increase vulnerability, because lower levels of production mean that any disruption of production would all the sooner result in yields below subsistence. Households could have compensated for the increased individual risk that resulted from yield-optimising strategies by social mechanisms that distributed available resources across the community.¹⁷⁵

However, peasants did not share Fenoaltea's confidence in social mechanisms – not necessarily because they doubted their neighbours' altruism. As Dio Chrysostom makes his peasant somewhat naïvely exclaim during his trial before the town assembly: 'what we even now have is sufficient for us, and do you take whatever you wish of it.'¹⁷⁶ Such was the ideal, even if reality did not always live up to it. More importantly, however, social mechanisms within the community did not always work. Harvest failure caused by flooding or plundering soldiers largely wiped

173 Columella 10.31ff.

174 On the profit-maximising peasant, Ellis (1988) 63ff. Cf. Watts (1984) 109: '... not interested in profit in the capitalistic sense'.

175 Fenoaltea (1976) 130ff.

176 Dio Chrys., *Or.* 7.42.

out an entire community's agricultural produce. When drought or excessive rainfall had affected the harvest far and wide, relatives in nearby villages were of little use. When nearly all households were confronted with shortage, there was little that relatives or neighbours could do, even if they were willing to. Therefore, direct production for one's needs was the main safety net. Hence, peasants preferred mixed farming, diversity of crops and fragmentation of holdings. Truly self-reliant, the rustic's wife in Dio Chrysostom's discourse proudly says: 'we do not need anything.'¹⁷⁷ Community help was important, but secondary.

Nevertheless, since cropping strategies that aimed at self-reliance also often failed, social mechanisms remained important. Community obligations were not merely an alternative to market strategies. More importantly, they reduced the scope for market-orientation, as peasants were not free to store or market their surpluses as they liked.¹⁷⁸ Lending seed-corn is hardly an income-optimising strategy, because the price of corn at sowing-time is invariably higher than at harvest-time.¹⁷⁹ Generally, it is precisely during crises that high earnings can be achieved, which the more successful peasant had to let slip if community obligations were to work. The rationale behind the 'moral economy' of the peasants was already clear to Hesiod:

A bad neighbour is as great a plague as a good one is a great blessing. He who enjoys a good neighbour has a precious possession. Not even an ox would die but for a bad neighbour. Take fair measure from your neighbour and pay him back fairly with the same measure, or better, if you can. So that if you are in need afterwards, you may find him sure. Do not get base gain: base gain is as bad as ruin.¹⁸⁰

Hence, in so far as smallholders were not profit-seeking, it was often self-interest, not irrationality or altruism, that made them so. Studies of peasants in later times have provided the valuable idea of 'constrained profit maximisation', which means that peasants pursue profit only within the limits that are set by their primary goal of long-term security.¹⁸¹

177 Dio Chrys., *Or.* 7.68. A nice parallel is offered by Hodges (1988) 143 on the attitude of 20th-century Turkish villagers.

178 Seavoy (1986) 14 argues that social mechanisms in peasant societies to share surpluses within communities discouraged production maximisation by individual households.

179 Interest-bearing loans in kind, as for instance customary in Egypt, are a different matter. See for instance P.Col. VII 176 = Rowlandson (1998) nr. 178.

180 Hesiod, *Work and Days* 345ff. See also the comment by Osborne (1987) 93; Garnsey and Morris (1989) 100f on a similar passage in Hesiod.

181 See Ellis (1988) 74.

Participation in product markets is not disputed. Even as an ideal, pure autarky could not be achieved. Two elements are often stressed in this regard: the necessity to buy essential goods and products, and the need to pay rents and taxes. The peasant ideal of self-sufficiency did not preclude the purchase of goods on the market, since some goods, like salt, iron tools, millstones or leather goods, could not be produced by peasants themselves and had to be obtained by purchase (including barter).¹⁸² Payment of monetary taxes and rents, it is pointed out, required smallholders to sell crops or their labour on the market in order to get hold of money with which to fulfil their obligations.¹⁸³ To a certain extent, this is obviously true, but in view of the large role of rents and taxes in kind, the impact of rents and taxes should not be overestimated. While indirect taxes, such as taxes on grazing (*scriptura*) or custom dues (*portoria*), and the poll tax were generally paid in money, regular direct taxes were often paid in kind.¹⁸⁴ This was certainly the case in Roman Egypt, where arable and other kinds of farming were taxed in kind (usually wheat), while vineyards, orchards and vegetable gardens were taxed in money. Regarding Ptolemaic and Roman Egypt, Jane Rowlandson recently pointed out that 'the large number of small-scale farmers did not need to sell part of their crop in order to obtain cash for the land tax, although they did need to acquire some money to meet their personal taxes and to buy goods like salt for their personal needs.'¹⁸⁵ In general, smallholders probably paid most of their taxes and public duties in kind.

The same is true of the rent paid on publicly or privately owned land. Many rents were in kind, whether it was a fixed amount or a fixed share of the yield.¹⁸⁶ The picture emerging from the *Digest*, which almost invariably assumes a rent in money, may be somewhat one-sided. The classic tenancy contract, as emerging from the legal sources, refers to the tenancy of whole estates (*fundi*) for the duration of five years. Such contracts may not reflect the reality of small-scale tenancy.¹⁸⁷ Frier doubts that the juristic model of tenancy 'accurately describes actual tenant farming in Roman Italy or the Empire generally; other evidence suggests that share-cropping . . . may have been at least as common as fixed-rent tenancy even

182 De Ligt (1990/1) I 47.

183 Hopkins (1980) 101ff. Cf. Pleket (1990) 43; Alcock (1993) 107; De Ligt (1993) 107, 140ff; Garnsey and Whittaker (1998) 317f. Cf. Scott (1998) 7ff regarding early modern Europe.

184 Recently, Howgego (1992) 22ff. Taxes in kind seem to have been preferred in the *Corpus Iuris Civilis*: Buck (1983) 40ff.

185 Rowlandson (1996) 19, 210; (2001) 147f.

186 See chapter five.

187 Kehoe (1997) 10ff, 138ff.

in Italy.¹⁸⁸ Cash rents, he argues, were common among the wealthier tenants, whose situation is more visible in the juristic sources than that of poorer tenants. Smallholders probably paid rents in kind rather than money.¹⁸⁹ In Roman Egypt, monetary rents were usually levied on land on which fodder, wine or flax were produced. In most cases, however, tenants were not forced onto the market and paid their rent in kind, usually wheat.¹⁹⁰

In addition, peasants may have acquired most of the money they needed for personal taxes and purchases on the market from occasional wage-labour on the estates and farms of their wealthier neighbours.¹⁹¹ Moreover, in other societies rents are often paid from the money earned from secondary produce, such as linen, butter or pigs.¹⁹² In other words, peasants may have participated in the market only partially. Hence, the degree to which smallholders – many of whom did not have to pay rents at all – were forced onto the market in order to fulfil their financial obligations to authorities and landlords seems to have been very limited.

Nevertheless, the participation of peasants in product markets or their use of money is not disputed. Several examples attest that the produce of the field or of garden plots is sold on the market.¹⁹³ One may think of the specialisation in cash crops on plots in Egypt, where large-scale cultivation of crops like flax or garlic is attested.¹⁹⁴ Later societies show that poor peasants sometimes cultivate cash crops, despite the dangers involved. However, such a cropping strategy in itself does not turn them into commercial farmers. Peasants often produced cash crops by force rather than by choice.¹⁹⁵ The means of production at the disposal of a poor

188 Frier (1989–90) 261.

189 Cf. Pleket (1990) 92; Mitchell (1993) I 244f. Contra: Alcock (1993) 109.

190 Rathbone (1993) 84; Rowlandson (1996) 245; (2001) 148; Sharp (1998) 69. Contra: Hopkins (1983) 87. Cf. Howgego (1992) 24f. Examples of rents in kind: P.Charite 7 and 8 = Rowlandson (1998) nr. 179 a and b.

191 Thus Sharp (1998) 116; Rowlandson (2001) 148.

192 Langton (1998) 383 n. 39, referring to Ireland.

193 Columella 10.311ff. Cf. Safrai (1994) 224; Horden and Purcell (2000) 221ff.

194 Crawford (1973) 359ff shows that in Ptolemaic times in the area of the village Oxyrhyncha (in the Arsinoite nome) garlic was grown on a surprising scale. Mayerson (1997) 204 notes that 'the cultivation of flax was far more profitable than grain.'

195 As in Spain, Simpson (1995) 49ff. Regarding tenants in antiquity, Foxhall (1990) 105. According to Epstein (1992) 76ff, however, the peasant was less risk-averse than sometimes assumed. He notes specialisation as a possible response of smallholders to population decline in the later Middle Ages: 'rising disparities in production costs might allow peasants in marginal areas to specialize in non-staple crops, in animal husbandry, or in petty crafts and industries, and trade them for staples from better suited arable areas' (p. 76). However, such a response depended on favourable market conditions (cf. p. 80).

family were not always adequate to grow enough food for an entire household. Under such circumstances, the subsistence goal had to be achieved by other means than direct subsistence production. Even a small plot may produce enough of a high-value cash crop (such as opium poppy nowadays in some Third World countries) to allow the exchange into sufficient food to sustain a household. The same applies to small-scale herdsmen, who tended their small flocks and exchanged meat and secondary products for other foodstuffs. Hence, even market-orientation may be part of a strategy that is aimed at fulfilling the requirements for a household's physical and social existence. The precondition for such a market-orientated subsistence strategy was the existence of a sufficiently stable market.¹⁹⁶ Selling produce and buying products on the market is no indication of a capitalistic attitude – which was for instance ascribed by Fergus Millar to the peasant communities in Apuleius' novel.¹⁹⁷

The question is whether market participation went beyond a subsidiary role within the margins that were allowed by the general aim of the household to fulfil its primary needs. The answer to this question depends on the balance between the farmer's vulnerability to risk and the extent of that risk. The former refers to the resources of each individual household, the latter to the nature of market and the wider economy. The vulnerability of market-oriented farming of cash crops consists of the instability of the exchange values of food and cash crops. In other words, the food security of market-orientated peasants is threatened when food prices rise, the price of the cash crop falls, or the harvest of the cash crops fails. The considerations regarding individual vulnerability to risk are obvious: a peasant struggling to survive at the best of times may be forced in bad seasons to sell animals or land in order to survive, entering a downward spiral towards the rural proletariat or worse. A tenant's position may be somewhat more secure, since he can fall back upon his landlord, who has a stake in his tenants' fate. Well-to-do family farmers have the reserves to sustain a loss. Hence, their decision-making is less constrained by an unwillingness to risk a low income during a 'bad' season, as long as the chances of earning a high income in normal years are large enough. In general, risk aversion declines as wealth rises.¹⁹⁸

196 Hence Halstead (1987) 78f rightly pointed out that we should be careful not to project cash cropping in relatively modern days onto the ancient world.

197 According to Millar (1981) 73 the world of the *Metamorphoses* may be described in the words used to describe medieval England: 'a capitalist-market economy without factories'. See also the critical remarks in Pleket (1993b) 334.

198 Cf. Ellis (1988) 84ff.

The second element is the extent of the risk, in other words, the frequency and extent of market price fluctuations, especially of food prices. Harvests varied tremendously between years of abundance and years of dearth. The strength of the food market – in the ancient world as much as in later times – was determined by the degree to which the market was capable of compensating for such harvest fluctuations in time and space by means of storage and transportation.¹⁹⁹ The degree of market integration determined the extent of the volatility of market prices of food and other commodities. Volatility was low when the market evened out local gluts and shortages by trade, or annual fluctuations in harvest size by storage. The same applies – albeit to a lesser degree, because of the larger elasticity of commodity prices – to non-food prices. If there was a large external demand for cash crops, local conditions had little impact on the price of such goods. Low price volatility meant that little risk was involved in market-orientation. Hence, Pleket is mistaken when he argues that the risks of agriculture rather than the imperfect markets forced commercial farmers to diversify their crops. If the markets had been less imperfect, i.e. had been more integrated, bad harvests would have had less impact.²⁰⁰

Conclusions

In Roman times, it was not the supposedly primitive nature of agricultural technology that was to be blamed for the low degree of development of non-agricultural sectors. There was undeniably a growth of urbanisation throughout antiquity and it need not have been changes of agricultural technique that explain this development. Rather, we should seek to understand it by looking at the wider economy. The question whether smallholders could afford to participate in markets plays a key role in the division of labour. It was largely determined by the nature of the market economy in which they operated. As we have seen at the start of this chapter, according to Ellis, their participation in ‘imperfect markets’ was a defining characteristic of the peasantry. In many regions, it was precisely the weakness of markets that shaped the world of the smallholder and gave such an important role to non-market forms of economic interaction, many of which were aimed at avoiding the risks that threatened peasant households.

199 On market integration, see chapter four.

200 Pleket (1993b) 337. Cf. Morley (1996) 75.

However, the picture was not all bleak. Integration of markets in some coastal regions of the Roman Mediterranean world broke through the limitations that held down the economy of isolated regions – and would continue to do so until the dawn of industrialisation. In some regions, economic growth occurred, and changes in the wider economy that peasants were part of also altered the conditions in which peasants chose the strategies to sustain their households. Market integration lowered the risks inherent in food market dependency, and offered more secure employment outside farming, thus freeing labour productivity from its restraints by reducing labour input in agriculture and allowing more efficient use of labour by means of specialisation.

CHAPTER 3

Farmers and their market relations

INTRODUCTION

We know surprisingly little about the operations of the grain trade in the Roman world. Our sources offer some evidence on the beginning of the chain, i.e. the market relations of the farmers, and the end of the chain in the urban market. The various stages in between and the middlemen involved remain relatively in the dark. This is not to deny that the epigraphic and literary sources mention many individuals, who present themselves – or are presented – as grain traders and merchants, but we have little idea of how the grain trade functioned, while also archaeology, because of the perishable nature of grain and its containers (sacks), has little to offer in this regard. Studies of the grain trade in later times may therefore contribute to our understanding of antiquity – though not in the sense that we may project the details of the later grain trade onto the Roman world. Two general features of the grain trade in medieval and early modern Europe are of importance to our understanding of the workings of the trade in the Roman Empire.

First, the grain trade was seldom a specialised business. In contrast to the Baltic grain trade dominated by Dutch merchants, large-scale businessmen in, for instance, France or southern Europe did not invest most of their capital in or derive most of their profits from the grain trade.¹ Sheila Pelizzon offers the following description of the corn trade in early modern France: ‘Grain trading, more often than not, was an unspecialized activity. Even firms engaged in international trade seldom traded exclusively in grain or did so only on a temporary basis. The major exception was the registered grain merchants of Paris. There were in addition large numbers of mealmen, millers and bakers, who, in addition

¹ See for instance Braudel (1966) 442f, 571ff.

to their productive activities, also traded in grain, meal or flour.² The trade in corn was often conducted by non-specialists and was closely linked to the processing of grain and the sale of finished products. There was a good reason for the lack of specialisation: the grain trade was considered a risky business, which not only required the investment of large sums of money for buying up corn, but also for its storage and transport. The market was insecure, so that large investments regularly turned into immense losses. The best insurance against the risks involved in the grain trade was diversification of activities, either by trading other goods besides grain, or by involvement in the processing of grain. Some millers or bakers traded in corn on a small scale as a secondary activity within their business. Lack of specialisation meant that several functions were concentrated in one hand. Peasants as well as wealthy landowners engaged in the functions of production, transport and trade. In early modern Spain and Sicily, for instance, peasants functioned seasonally as muleteers and traders, connecting peasant-producers to urban markets or export harbours.³

Many people who were engaged in land or sea transport – whether as full-time professionals or as part-time peasants – occasionally took part in trading activities. This phenomenon can be seen in the Roman world as well, where the same individuals sometimes acted as shipowners, captains and merchants.⁴ A further implication for Roman history is that the non-specialists are often invisible in the ancient sources on the grain trade. *Mercatores* and *negotiatores* may or may not occasionally have been involved in the grain trade.⁵

Secondly, the study of early modern Europe shows that the number and type of middlemen in the grain trade varied according to location and economic conditions. Large-scale trade, supplying structural markets, such as a city like Paris, offered the necessary conditions for specialising grain traders or grain-‘businessmen’ who had the financial means to bear an occasional loss. The demand of armies and fleets had a similar impact. These rich grain merchants, generally operating from cities, covered large territories and connected regions across great distances. Hence, they required the assistance of middlemen, whether as ‘factors’ within their own firms, or as small, independent merchants.⁶ As the scale and distance

2 Pelizzon (2000) 108. See also Hufton (1985) 115ff.

3 Ringrose (1970); Davies (1983) 380. Also Pelizzon (2000) 115f.

4 Rickman (1980a) 124ff, 141ff; Herz (1988) 58; Aldrete and Mattingly (1999) 184.

5 On the meaning of both words on Roman inscriptions, see Kneissl (1983).

6 Pelizzon (2000) 108f. Regarding middlemen and agents in England, see Chartres (1985) 469ff.

of the trade diminished, the number of middlemen and the degree of specialisation tended to decrease. In isolated regions there were few middlemen, if any at all. Often, farmers and consumers traded directly (or food was distributed otherwise). The corn trade in such regions tended to be dominated by the rural elite, usually wealthy landowners.⁷

The ancient evidence naturally tends to provide the best (or even sole) evidence on the specialised and large-scale grain trade that supplied cities like Rome. For instance, inscriptions mention *mercatores frumentarii* in Ostia, who are surely related to the supply of Rome.⁸ Large-scale dealers in grain are also mentioned in a number of wax tablets found in Pompeii. These men had lent money against the security of grain, in one case 7,000 *modii* of Egyptian wheat and other foodstuffs, in another 13,000 *modii* of Alexandrian grain.⁹ It would offer a false impression to construe from this evidence a picture of the grain trade 'in general' in the Roman world.¹⁰ The Egyptian evidence shows that the trade in foodstuffs and other goods from and between towns like Karanis 'was clearly not conducted by large capitalistic enterprises'. Merchants like Nikanor, part of whose archive has survived, traded in various goods – mainly wine, grain and drugs, but also clothing and wood – on a small scale.¹¹ In Roman Palestine, large-scale businessmen, who engaged in overseas trade and who relied on agents, are attested. However, these traders did not specialise in one particular commodity. Jewish sources mention the *siton* (derived from the Greek *sitonēs*), a trader in grain, wine, oil, fruit and bread.¹² Even the wealthiest merchants of the later Empire, it has been observed, were men of comparatively small means.¹³ The evidence of Libanius shows on the one hand

7 Reher (1990) 158 notes that there were few important grain merchants in central Spain before the end of the 18th century, and even then they were almost exclusively involved with the supply of grain to major cities like Madrid. Reinhardt (1991) 340 observes that there were no middlemen involved in the grain market in the region of Rome, where producers served as suppliers. However, as the example of England shows, where many landowners operated as corn shippers and buying agents, this phenomenon is not restricted to peripheral markets. See Chartres (1985) 472.

8 CIL XIV 303. See Kneissl (1983) 77. On the other hand, such *negotiatores frumentarii* as those from Lyons, Mainz, Aachen and Nijmegen may be related to the troops on the Rhine. Jacobsen (1995) 35.

9 Casson (1980) 26ff.

10 Cf. Paterson (1998) 160ff, who proposes a 'model of a relatively dynamic economy in which large numbers of independent operators take part' (p. 162). He argues that the trade in olive oil from southern Spain shows little overlap of individuals involved at various stages. In other words, there was a high degree of specialisation.

11 Alston (1998) 178ff. Quote from p. 178. See also Drexhage (1982) 70f; Rathbone (1997) 197; Sharp (1998) 205ff.

12 Ben-David (1974) 191.

13 Liebeschuetz (1972) 83.

the absence of large-scale and wealthy businessmen in fourth-century Antioch, on the other the domination of local large landowners in the food supply of the city.¹⁴ Of course, senators and *equites* were generally involved in the trade of grain, wine and oil, if only because they were almost without exception large landowners. However, the evidence of senatorial involvement in the grain trade is meagre. It is for instance doubtful whether the *horrea Galbiana* in Rome indicate that the patrician family of the Sulpicii Galbae was engaged on a large scale in the grain trade.¹⁵ Of some significance is also the fact that few grain merchants are known of equestrian, or even curial, status.¹⁶ Although it is always possible to counter this argument by the hypothesis that many small traders and merchants were backed by senators and *equites*,¹⁷ the contrast with the number of decurions whose wealth was related to the trade in wine, oil or luxury goods such as textiles remains striking.¹⁸

FARMERS AND THE CONSUMER MARKET

The agricultural writers and the market

It surely is no coincidence that, except for Cato, the agricultural writers pay little attention to the marketing of their produce.¹⁹ Farmers and peasants had two options of selling their grain, wine and olive oil: either they sold it at the gate, or they brought it to urban buyers and markets themselves. The main question regarding the marketing of corn is whether farmers and peasants retained a large role in the distribution and marketing of their crops, or whether merchants stepped in at an early stage. An indication of the latter situation are the so-called sales of grapes on the vine and olives on the tree. The advance sale of wine and olive oil indicates a certain aloofness from the market, induced by the preference to avoid the risks involved in marketing. One gets the impression that

14 Schneider (1983) 59ff, esp. 70. Wiemer (1995) 284 observes that grain merchants in Antioch are not attested in the works of Libanius. Cf. Liebeschuetz (1972) 48 who observes that the aristocracy of Antioch were landowners who sold corn, but they could not be described as corn merchants (see also pp. 73ff, 126ff).

15 Mratschek-Halfmann (1993) 102. Cf. Habermann (1982) 56; Rickman (1998) 323.

16 Harris (2000) 732.

17 Thus also Aldrete and Mattingly (1999) 185f. See D'Arms (1981), esp. 39ff on the role of freedmen; Aubert (1994) 21ff on the role of *institores* in petty trade.

18 Pleket (1990) 65, 124f, 129ff. See also Jacobsen (1995) 71ff concerning Gaul and the Rhine provinces.

19 Thus, Morley (1996) 159; (2000) 214ff.

many Roman landowners saw the cultivation of olives and vines as their primary task, but that they avoided close involvement in the processing and marketing of these crops. Nevertheless, the sources also show that landowners often sold wine as a finished product. Columella wrote that the storage of wine increased its value, and Varro remarked that farmers profited when they sold at the right moment,²⁰ which implies that farmers kept an eye on current market conditions.

The fact that the agricultural handbooks pay little attention to marketing has led Hamish Forbes and Lin Foxhall to believe that such tasks were left to the *vilicus*.²¹ The *vilicus*, they argue, was not unlike the modern Greek farmer. He was a peasant, rather than a commercial farmer. Hence, Roman *vilici*, just like Methana farmers, preferred 'to keep wealth in form of stored products'. However, their emphasis on the role of the *vilicus* may be mistaken. The *Digest* provides evidence that the *vilicus* was not commonly in charge of the marketing of goods:

Since a bailiff (*vilicus*) is appointed to farm rather than to trade, a person who deals with the bailiff of another has no action against the owner. But if I authorise my bailiff to sell goods as well, it is fair that I should be liable to an action based on the action for the manager's conduct (*actio institoria*).²²

The *actio institoria* was introduced in the late second century BC. It provided the legal means to hold a *dominus* responsible for the transactions and contracts concluded by his representatives and agents. Whether the *actio institoria* could be applied in a certain case depended on whether the representative (free or slave) had been entitled to engage in the kind of transaction that was disputed. When entering into a contract with an agent or representative, one had to make sure that he had been appointed by the *dominus*. The above passage from the *Digest* offers as a general rule that the *actio institoria* does not apply to *vilici*, since their duties were normally limited to farming. Only when the estate-owner had explicitly appointed the *vilicus* to sell goods, could he be charged on the basis of the *actio institoria*.²³ It follows that, according to the Roman jurists, the selling of produce did not belong to the tasks of the *vilicus*, although it was possible (according to the passage above) that the *vilicus* was also explicitly put in charge of the selling of produce as a kind of agent (*institor*). Roman landowners left the actual work as much as possible to others, including *vilici*, agents and outside contractors, but it is likely that

20 Columella 3.21.6; Varro 1.69.1.

21 Forbes and Foxhall (1995) 78ff. Cf. Aubert (1994) 172f.

22 Paulus, *Digest* 14.3.16.

23 Aubert (1994) esp. 8f, 169ff.

they were still very much involved in the decisions on what, when, where and how to sell.²⁴

The Roman authors of agricultural handbooks concentrated on the estate as a productive unit, but they were well aware that the prosperity of farms partly depended on their surroundings, including the opportunity to buy and sell. Varro and Columella offer the most detail in this regard. The differences in their accounts make it worthwhile to compare both authors in full.²⁵ There are various aspects to the importance of the surroundings of the estate, Varro says:

. . . whether the neighbourhood is unsafe; whether it is such that it is not advantageous to transport our products to it, or to bring back from it what we need; third whether roads or streams for transportation are either wanting or inadequate; and fourth, whether conditions on the neighbouring farms are such as to benefit or injure our land. Taking up the first of the four: the safety or lack of safety of the neighbourhood is important. . . . Farms which have nearby suitable means of transporting their products to market and convenient means of transporting thence those things needed on the farm, are for that reason profitable. For many have among their holdings some into which grain or wine or the like which they lack must be brought, and on the other hand not a few have those from which a surplus must be sent away.²⁶

A farm is rendered more profitable by convenience of transportation if there are roads on which carts can be easily driven or navigable rivers nearby. We know that transportation to and from many farms is carried on by both these methods.²⁷

From a market-oriented viewpoint, this is disappointing advice. Remarkably, Varro assigns first place to the safety of the region, not – as any modern landowner would do – to the marketing opportunities offered by the location and the availability of adequate means of transport. The examples he offers are limited to Sardinia and Lusitania, where rapacious peoples threaten neighbouring estates. This is hardly of prime importance to the average Italian landowner.²⁸

24 Thus also Paterson (1998) 159. When absent, landowners were represented by *procuratores*. See Schäfer (2001) 273ff.

25 See also Cato, *de agri cult.* 1.1ff.

26 Varro 1.16.1–2. On this passage and the following, see De Neeve (1985) 79f; Laurence (1998) 139ff. Both, however, seem to see more awareness of marketing opportunities than the passages actually warrant. Cf. Reekmans (1986) 261f.

27 Varro 1.16.6.

28 It may be relevant to note that in his survey of factors determining the price of land in Roman times, De Neeve (1985) 84 has no other examples to offer of the importance of ‘insecurity’, except for general references to the anarchy and proscriptions that lowered the price of land during the late Republic.

Moreover, the conveyance of the crops from the estate is no more important to Varro than the supply of goods towards it.²⁹ The facilitation of transportation by roads and navigable rivers is primarily seen as a matter of convenience. To a modern observer, it would be of the utmost importance whether the location would offer access to overseas or local markets. This consideration only occurs in the next few sentences, where Varro advises against the cultivation of flowers and other garden crops in isolated regions, since only large cities offer an adequate market for such goods.³⁰ The market for such staple goods as grain, wine and olive oil is taken for granted. It is transportation, not marketing, that he has in mind. Varro fails to note that, while the cost of transportation is part of the production costs, and thus of some importance, it is the marketing opportunities that determine the prices that the crops may fetch. Varro never expresses the thought that access to a good market means that good harvests may be sold at good prices. This is not to deny that Varro welcomed a profit, but he is production-oriented, not market-oriented in his approach to profitability.³¹

It seems to be the same line of thought, when Varro adds a few lines further that the convenience of transport enhances the productiveness of an estate (*eundem fundum fructuosiores³² faciunt vecturae*). Columella, whose work has close parallels to the work of Varro in this section, offers a variation on this thought:

A handy road contributes much to the worth of the land: first and most important, the actual presence of the owner, who will come and go more cheerfully if he does not have to dread discomfort on the journey; and secondly, its convenience for bringing in and carrying out the necessities – a factor which increases the value of realised crops (*quae res frugibus conditis auget pretium*) and lessens the expense of bringing things in, as they are transported at lower cost to a place which may be reached without great effort. And it means a great deal too, to get transportation at low cost if you make the trip with hired draught-animals, which is more expedient than looking after your own.³³

29 Also, Columella 1.2.3.

30 Cf. Columella, 3.2.1.

31 One may add that also the jurists' consideration of what was to be included in a *fundus cum instrumento* was solely based on an estate as a productive unit.

32 The word *fructus* is closely related to the word *reditus*. De Neeve (1985) even assumes that they were 'as good as synonyms' and makes no further distinction between references to both terms. However, there is a subtle difference in their respective meanings. *Fructus* refers to yield, the degree of productivity, not income or profitability. The word that was used in the latter meaning was *reditus*. This is also illustrated by the examples cited by De Neeve (82f).

33 Columella 1.3.3. Cf. 1.2.3.

Like Varro, Columella makes little distinction between the conveyance of crops from the estate and the supply of goods towards it. Neither does he refer to the higher profitability of estates near structural markets. However, he is much more explicit than Varro about the financial advantages of cheap transport and – most importantly – he realises that cheap transport means higher prices for the estate's crops. His reasoning is thus: good roads lower the cost of transportation; thus on the one hand, it is cheaper to bring in supplies, and on the other, the crops may be sold at a higher price, because the crops may be conveyed at lesser cost by the purchaser. This passage shows that Columella has in mind the selling of crops on the estate. If Columella had meant to say that it was less costly for the owner to bring his crops to the market, he would not have said that the price was higher, since the price fetched at the market would have been the same.

Cato also advises selling on the estate. The passage that contains the famous dictum 'the *pater familias* should be a seller, not a buyer' starts with the equally terse advice:

He should hold an auction. He should sell oil, if the price is satisfactory, and sell the surplus of wine and grain. Sell worn-out oxen, blemished cattle . . . a sickly slave and whatever else is superfluous.³⁴

This is not to say that wealthy farmers did not buy. Cato advised that when the owner was making an inventory of the various stocks, those goods he was short of for the coming year should be bought; superfluous stocks had to be sold.³⁵ Auctions occur elsewhere in Cato's work: the advance sale of wine or oil and the contract for the harvesting and processing of the grapes and olives should also be sold at an auction.³⁶ From the time of Cato, we have evidence that deposit-bankers (*argentarii*) attended auction sales in order to advance credit to buyers.³⁷ They paid the purchase price to the sellers and advanced a short-term loan to the buyers. Their involvement stimulated trade, since it offered small traders the capital that they required to tide them over the time between the purchase and the further sale.³⁸ The role of *argentarii* in auctions – including auctions of agricultural produce – indicates that on such occasions crops were often sold to middlemen, who expected to earn the means to repay the loan – and a profit too.

34 Cato, *de agri cult.* 2.7.

35 *Ibid.* 2.6.

36 *Ibid.* 144ff. Also 2.6. See Morley (1996) 161f.

38 *Ibid.* 39.

37 Andreau (1999) 30f.

The avoidance of overhead costs constituted the main advantage of selling at the gate. One may add that it also offered the most convenient way for the landowner to supervise sales without having to visit nearby markets in person. *Vilici* were permitted to conduct sales at markets only reluctantly – and only if it was necessary.³⁹ Hence, it is not surprising that one occasionally meets traders buying on the landowner's estate. Varro mentions two brothers, who made much money from the sale of honey 'as they said they preferred to wait until they could bring in the buyer at the time they wanted rather than at an unfavourable time.'⁴⁰ In this particular case, the difference in social status between both parties is clearly indicated by the fact that the owner calls for the traders. It is likely that landowners, who dealt with the same traders every year, usually received them at their estates in order not to condescend to the traders' social level. Unfortunately, when Columella writes that if the estate is near a city, grapes for the table and other fruits are commonly sold to merchants, he does not inform us whether these traders bought at the gate or not.⁴¹ However, more important is the conclusion that estate owners dealt with urban-based merchants, presumably on a regular basis, who bought such produce as honey, fruit and flowers.

Regarding wine and olive oil, there is clear evidence that landowners conveyed the products of their estates to nearby towns and cities. The evidence is sparser concerning grain.⁴² There were two possible reasons for landowners to convey their produce to town: part of their produce was intended for consumption by their household or for distribution among dependants, part was sold at the market, including to merchants who exported to overseas markets.⁴³ It is important to realise that landowners often transported large amounts across considerable distances for the purpose of both consumption and sale.

Elite distribution

A member of the elite who had any self-esteem took care to put various products of his own estates on his table. He who bought his bread or wine

39 Columella 11.1.23.

40 Varro 3.16.11. Cf. Morley (2000) 218f.

41 Columella 3.2.1.

42 Galen mentions a ruse employed by rustics, who transport grain by carts into town. They hide jars of water among the grain, which is evidently not their own, and which absorbs the water and thus increases in volume, making it possible for them to steal part of the grain without being caught. Quoted in Garnsey (1988) 48.

43 Vitruvius 6.5.2 also tells us that the houses of landowners should include stables, granaries and shops (*tabernae*).

at the market was a worthless fellow, as may be inferred from Cicero's diatribe against Piso, who is depicted as a man of no taste, no refinement, and no elegance. Amongst the faults of his table, Cicero observes that he has no baker and no wine cellar; his bread comes from a bakehouse, the wine from a tavern.⁴⁴ In addition, landowners had to support the workforces on their various estates as well as the staff of their urban villas. For instance, regarding the inheritance of estates with equipment, the jurist Papinian distinguished between stores of wine on an estate that were meant for the consumption of the estate's workforce, and those stores meant for distribution to the city or other estates.⁴⁵ The archives of Egyptian landowners also show that their urban households consumed the produce of their various estates.⁴⁶ In Egypt, the conveyance of grain between the estates of the same owner and from one owner to the other was even facilitated by the public granaries. Although these were primarily meant for the storage and distribution of public grain, private owners could deposit grain into them. Payments in kind could then be made to officials or private individuals at other places by issuing an order to pay. By transferring grain on paper, public granaries helped estate owners to avoid the cumbersome transport of grain.⁴⁷ Likewise, as the fourth-century Kellis account book shows, tenants occasionally paid their rent at the landlord's request to third parties in order to avoid unnecessary transportation.⁴⁸

Landowners whose property was spread over large territories supplied their table from their own estates and fed their various workforces from their own crops.⁴⁹ One may wonder why landowners did not simply sell all their crops and use the income to buy products on the urban market

44 Cicero, *In Pisonem* 67. See Frayn (1993) 59.

45 ... *unde instruebatur vel in urbe vel in aliis praediis*. *Digest* 33.7.12.39. Varro 1.16.2 may be alluding to this practice, when he says that some of a landowner's farms are short of wine or grain, while others have abundance. Cf. De Ligt (1993) 163 n. 27. Moreover, in an inscription containing the grant of privileges to a former captain of Octavian's fleet, it is explicitly stipulated that products from his own fields or herds, which were carried away for his own needs, were exempt from taxes levied by municipalities and *publicani*. Freis (1994) nr. 24 = FIRA I 55 = IGLS III 718.

46 Many examples are discussed by Sharp (1998) 141ff.

47 *Ibid.* 253ff.

48 Bagnall (1997) 35.

49 The importance of this regarding the Roman period was emphasised by Whittaker (1985) 58ff; (1983) esp. 169ff, who refers to more examples than the ones mentioned above. Sceptical of the importance of such internal supply are Aldrete and Mattingly (1999) 187. Aristocratic families and knightly estate-owners in late medieval England also tended to obtain their staple food from their own demesne. Dyer (1989) 308, 312. A further example is briefly mentioned by Casey (1985) 221: 'In a town like Carmona, where most of the best grain lands were in the hands of absentee nobles living in Seville, most wheat was exported not by sale but in rent.' Likewise, Mitchell (1993) 244 on Roman Asia Minor.

and to pay or reward slaves, labourers and clients. One obvious reason was that selling cheap and buying dear was to be avoided. The aristocratic landowners of early modern Rome, who fulfilled their own needs as much as possible from their landholdings, may reflect a similar attitude. Volker Reinhardt points out that the needs of rich families, which included wages to be paid in kind, were large, while in times of crisis Rome's aristocracy avoided humiliating dependence on the market at any cost.⁵⁰ Elite distribution was part of an economy in kind that directly linked producers to consumers.

The dominance of monetary transactions in the economy as a whole need not be in conflict with the importance of payment in kind in particular sectors of the economy.⁵¹ Christopher Howgego has emphasised that the use of barter or payments in kind does not reflect an insufficient monetisation of the economy or a shortage of coinage. The use of kind is rather caused by convenience in a particular context. The state levied taxes in crops it required; rents in kind protected tenants from the risks of the market.⁵² He concludes 'the Roman world was one in which money was the normal form of exchange for goods, at least in the towns, but money use was relatively unsophisticated. Agricultural produce, particularly corn, played a significant role alongside coin in taxation, rents, wages, and credit.'⁵³

Food was not only handed out as rations to rural and urban workforces, it was also used as salary or payment in kind.⁵⁴ Examples abound in Roman Egypt, where labourers received food rations or wages in kind, and also widows or town schoolteachers were supported by allowances in money and kind.⁵⁵ In her declaration of grain stock, a wealthy woman

50 Reinhardt (1991) 152. Morley (2000) 218 agrees that, as consumers, villa-owners avoided the vagaries of the market.

51 See in particular the conclusion by Rowlandson (2001) 154. In general, Crawford (1970) 40ff; Howgego (1992) 16ff. Cf. Temin (2001) 173f. Regarding Egypt, Alston (1998) 187.

52 Howgego (1992) 22ff.

53 *Ibid.* 29. Millar (1981) 73 points out that all transactions in Apuleius' *Metamorphoses* are monetary, 'down to the lowest levels'. Millar's argument is not so much in contrast to Howgego's conclusion as that it is one-sided. Millar points to a few transactions in which goods are exchanged on the market for cash. Howgego agrees that in such a context, cash is the normal form of exchange. Millar's examples of monetary transactions, however, do not run counter to the conclusion that in other contexts transactions are often in kind. Cf. Liebeschuetz (1972) 83ff concerning money in fourth-century Antioch.

54 In early modern Europe, payments were often accounted for in monetary terms, but paid in kind, including land and livestock. See for instance Davies (1983) 385; Seavoy (1986) 62; Dyer (1989) 322.

55 Allowances: for instance P. Oxy. 47.3366; P. Oxy. 27.2474; P. Test. Roma³ 26. Cf. P. Oxy. 6.907; PSI XII 1258. During the fourth century AD, ministers, virgins and widows received

from Oxyrhynchus stated that from her various granaries ‘monthly allowances are given to the managers, bailiffs, farmers, servants and monthly workers’ (AD 246).⁵⁶ Papyri from the late first and early second century AD concerning the estate of Sarapion show that casual labourers were usually paid in money, but that permanent employees received an allowance in kind, possibly in addition to cash payments.⁵⁷ Payments in wheat were not simply fixed subsistence allowances, as a letter from the third century AD illustrates, which informs us that the workers in a workshop had been offered one and a half times the agreed wages of wheat, because the price of corn was very low.⁵⁸ This example shows that wage-earners in Egypt kept an eye on the current value of their wages-in-kind.⁵⁹ During the third and fourth century AD, payments were often made in wine, especially to workers of the estate. On the Appianus estate, money wages were regularly substituted by payments in kind, particularly wine.⁶⁰

Allowances to slaves and labourers are attested outside Egypt as well. In Palestine, many fieldworkers received their wages in food, sometimes in weekly or yearly allowances of flour. The degree of poverty of such fieldworkers is implied by the rule that they were not allowed to feed their children from their daily rations – while starving themselves – because this would be at the cost of their employer.⁶¹ In Diocletian’s price edict of AD 301, the wages of wage-labourers include rations of food.⁶² In one of Plautus’ comedies, it is said that slaves are eager to receive their rations, but not to do their work.⁶³ Seneca mentions an actor of servile status who received 5 *modii* of grain and 5 *denarii* each month.⁶⁴ The amount of grain is larger than needed for one person, so it is likely that the allowance was meant to be more than a simple subsistence ration. This is even clearer in a case mentioned by Libanius in one of his letters

rations in kind. Hollerich (1982) 191f. See also Kehoe (1997) 92, 131ff; Sharp (1998) 129; Banaji (2001) 182ff.

56 P.Oxy. XLII 3048 = Rowlandson (1998) nr. 174.

57 Sharp (1998) 82ff, 178ff, including payment of wheat to harvesters (P.Sarap. 75 recto) and allowances of wheat to permanent employees (P.Sarap. 76). See also Rathbone (1991) 107ff.

58 P.Oxy. 14.1668. Bowman (1986) 109.

59 This implies that as a wage, wheat was used as a medium of exchange. See in contrast Rowlandson (2001) 149, who argues that there is ‘no evidence of wheat being used as a medium of exchange’ beyond the unmonetised areas of the agricultural economy.

60 Rathbone (1991) 113, 169f; Howgego (1992) 16; Rowlandson (1996) 233.

61 Hamel (1990) 37. Alderman and Sahn (1989) 84f point out that in Third World countries, wages are often paid in kind, in particular in the form of ‘on-site feeding of workers’, in order to achieve ‘nutritional adequacy’ in the lean months of the year and thus to preserve the productivity of workers. They remark that ‘it is only the nutrition of the worker and not the family that is of concern to the employer’.

62 Freis (1994) nr. 151, 7.iff.

63 Plautus, *Stich.* 59.

64 Seneca, *Ep.* 80.8.

(dated AD 359/60): the sophist of the town of Elusa in Palestine received an allowance in kind, but tried to persuade local traders to buy his rations. Libanius wrote to a local councillor with the request to use his influence with the traders in this matter on behalf of the sophist.⁶⁵ Clearly, the sophist received more food than he needed or wanted.

The emperor's household may in this regard reflect a practice that was common in the urban households of all the wealthy families. In mid-second-century AD Rome, a supervisor of the handing out of grain to the imperial slaves is attested. As his epitaph informs us, the freedman Publius Aelius Chrysanthus had been responsible for handing out the grain to the imperial servants (*cubicularii*).⁶⁶ A passage in the works of Ammianus Marcellinus referring to the fourth-century AD court sheds further light on this. After his accession to the throne, Julian was astonished to find that a mere barber at the imperial court in Constantinople received an allowance of 20 rations of grain and the same amount of fodder for pack-animals, apart from the money he received. Angered by the corruption and abuse, Julian discharged many court attendants who received similar amounts.⁶⁷ By this time, and probably earlier, a redistributive system had emerged within the imperial court, in which grain rations were used to supplement monetary payments. One may infer that similar payments in kind were made – on a much more modest scale – to at least some of the slaves in elite households. One may also think of the *sportulae*, which contained portions of food and which were distributed to one's clients. The private distributions of corn, wine and other foodstuffs in towns throughout the Roman Empire should be seen within the context of the distribution of the agricultural produce of urban landowners' estates. The point is that the volume involved in this non-market distribution of grain and wine towards towns and cities might have been much larger than the direct subsistence of their households required.

Landowners and the urban market

Landowners also transported goods to town in order to supply the local consumer market or to sell to merchants who exported to overseas markets. For instance, when the town of Pidasa joined the city of Miletus

⁶⁵ Libanius, *Ep.* 132. Liebeschuetz (1972) 89.

⁶⁶ CIL VI 8771 = Eck and Heinrichs (1993) 335.

⁶⁷ Ammianus 22.4.9f. Liebeschuetz (1972) 89f points out that some court officials devised ways to turn their wages in kind into cash.

in the early second century BC, it was decided that citizens of Pidasa were allowed to export wine from their own vineyards to Miletus, up to a sizeable maximum of one thousand *metretai* (39,400ltr).⁶⁸ Hadrian's law concerning the sale of olive oil in Athens explicitly tells us who sells the landowner's produce:

Die Olivenbauern sollen den dritten Teil (des Olivenöls auf den athenischen Markt) bringen . . . Beim Beginn der Ernte sollen sie das Öl teilweise gemäss der Schätzung des [Erntenden] bringen und den städtischen Ölkäufern [geben, die] für den [öffentlichen Bedarf] Vorsorge treffen. . . . Die Ernteerklärung soll unter Eid erfolgen und soll enthalten, wieviel er insgesamt erntete und das, was durch seinen Sklaven oder Freigelassenen (geerntet wurde), falls der Besitzer des Landes oder sein Pächter oder der Ernteverkäufer die Ernte verkauft. Derjenige, der (die Ernte) für den Export verkauft, soll bei denselben Beamten eintragen lassen, wieviel und wem er (die Ernte) verkauft und wohin das Schiff fährt. . . . Auch der Kauffmann soll eintragen lassen, dass er exportiert und wieviel er von jedem Lieferanten exportiert.⁶⁹

Three alternatives are mentioned: the owner could sell the oil himself, or his tenant could sell it, or an 'oil-jobber' ('Ernteverkäufer'), which probably refers to a contractor. The olive oil was partly sold to urban magistrates; the rest entered the market. Merchants bought some of the oil for export. From our point of view, it is interesting to see that oil merchants operated from Athens and bought the produce that the landowners, their tenants or contractors brought to the city.

Some landowners took care of the conveyance of their crops by ship. Already the *lex Claudia de nave* from 218 BC, which forbade senators to own ships, made an exception for boats that had a capacity of no more than 300 amphorae (about 15 tonnes) and that were explicitly meant to transport their own produce.⁷⁰ In the 70s BC, Cicero dismissed this law in public as a dead letter, but in principle landowners still only owned boats for the purpose of transporting the goods from their estates. This is implied when Cicero condemns Verres for having a freighter built by an allied community in order to convey the loot from his rapacious governorship of Sicily. Cicero ridicules Verres, saying that nobody would believe that the freighter would be used to transport the crops from Verres' estates.⁷¹ To facilitate the conveyance of goods to and from the

68 Milet VI 1, 184f = Brodersen (1999) nr. 470.

69 IG II/III² 100 = SEG XV 108, XXI 501 = Smallwood II nr. 443. Transl. Freis (1994) nr. 85. The English translation by Oliver (1953) 962f differs in some details.

70 Livy 21.63.3f. Tonnage: Houston (1988) 559.

71 Cicero, 2 *Verr.* 5.46.

estates, some villas were equipped with their own harbours.⁷² By Cicero's time many senators undoubtedly participated in shipping.⁷³ Landowners acted as traders and sold their crops in overseas markets. The fourth-century orator Libanius, for instance, owner of an estate near Antioch, sent his farm produce upriver and to overseas markets.⁷⁴ Another example is provided by Petronius: Lichas of Tarentum – who was not only captain of his own ship, but is also described as owner of considerable estates and a trading firm – is bringing a shipment to market. Undoubtedly, the attitude of Lichas of Tarentum towards the marketing of his produce was unlike that of a senator like Pliny, whose social and political obligations left him little opportunity to participate so directly in the selling of his crops. We may in this regard refer to H.W. Pleket, who emphasised that wealthy landowners in the Roman world did not all show the same attitude. He assumes the presence of both market-oriented, profit-expecting, rational villa-owners and powerful, extremely rich landowning magnates of the senatorial and equestrian class, who lived far from their estates and who were only interested in the fixed rents paid by their tenants.⁷⁵

We have seen that wealthy farmers sold their crops at the gate to traders who bought honey, fruit, vegetables, but also grain, wine and olive oil. The main reason was the avoidance of overhead costs and trouble, but the social distinction between rich estate-owners and more humble urban traders also played a role. Commercial farmers offered the advantage to traders that they could rely on a more or less steady supply, while the amounts bought from commercial farmers involved less strain and costs than buying from many dispersed peasants.⁷⁶

THE ADVANCE SALE OF GRAIN, WINE AND OLIVE OIL

One particular way of marketing their crops that was used by wealthy farmers was the advance sale of crops. The ancient sources show that the selling of grapes on the vine and of olives on the tree was common in the

72 Purcell (1995) 170; De Souza (2000) 236.

73 D'Arms (1981) 31ff, p. 37 on Cicero, 2. *Verr.* 5.45.

74 See Liebeschuetz (1972) 75, with references.

75 Pleket (1990) 99: 'Marktorientierte, auf Gewinn rechnende, rationale Villenbesitzer sind neben mächtigen, superreichen Grundherren des Senatoren- und Ritterstandes anzunehmen, die weitgehend fern von ihren Gütern leben und nur an den festgesetzten Rentenzahlungen ihrer Pächter interessiert sind.'

76 Cf. McArdle (1978) 86 on the selling of their produce by the Medici in early modern Tuscany. See also Pelizzon (2000) 110 regarding early modern France.

Roman world. In contrast, there are few sources on the advance sale of grain by large landowners. The reason may be provided by the considerations that made advance sale of wine and olives an attractive option to the buyers as well as the sellers.

Evidence for the advance sale of wine and olives occurs from the second century BC to the time of Justinian.⁷⁷ Cato's work on agriculture contains a number of contracts for the harvesting and/or processing of crops and for their sale.⁷⁸ His treatment of the matter shows that the advance sale of the crop and the harvesting/processing of the crop were separate issues. The pressing of olives was a process that could take months on larger farms. The large presses that were used on the estates of wealthy landowners constituted a considerable investment. Hence, it was wise to make as much use of each press as possible. This was for instance done by spreading the pressing of the previous olive harvest over a period of several months.⁷⁹ The investment in presses may also have been a factor that induced farmers to let out the processing to third parties.

The contract for the sale of olives on the tree offered two options: either the landowner let out the contract for the harvesting/processing, which was then included in the contract with the purchaser, or the purchaser himself let out a contract for the harvesting/processing to a third party. This is confirmed by the terms for the letting of the gathering of the harvest: 'The contractor will gather the whole harvest carefully, according to the directions of the owner or his representative or the purchaser of the crop.'⁸⁰ According to this passage, three parties could let out the contract for the gathering of the crop: the owner, his representative, or the purchaser. Cato also mentions the harvesting of wheat, which should be let out for one sixth of the unprocessed crop on unfertile soil, one ninth on good soil.⁸¹ When the owner let out the harvesting to a contractor, the crop remained in the possession of the landowner. According to Cato's contract for the harvesting of olives, the harvesters had to take an oath, saying that they had not stolen olives from the landowner, which implies

77 Papyri found in Palestine in 1961 contained 'Babatha's archive'. Among the evidence of the management of her property is a contract for the gathering and sale of the date harvest. The contractor was to pay a certain amount of dates. Broshi (1992) 233f uses the inappropriate term of sharecropping in this regard.

78 See also Kehoe (1989) 563ff.

79 On press sizes, investment and capacity, Mattingly (1993) 484ff.

80 Cato, *de agri cult.* 144.1.

81 *Ibid.* 136. Foxhall (1990) 107 mistakenly interprets this as sharecropping. It is unbelievable, though, that a sharecropper should accept a rent of almost 90%, even on fertile soil.

that the olives remained the landowner's property.⁸² In contrast, Cato's contract for the advance sale of olives stipulates the payment of a fixed sum of money and the delivery of fixed amounts of olives and olive oil. In a comparative case in the *Digest* concerning the contract for the harvesting and processing of olives, the landowner received a fixed amount of oil.⁸³ Both cases imply that the rest became the property of the purchaser or contractor.

The crop or the contracts were sold at an auction to the highest bidder. Cato offers contracts for the sale of olives on the tree and for grapes on the vine. The contract for the advance sale of wine is equal to the sale of olives, except for the clause that the purchaser has to collect the wine before 1 October.⁸⁴ Cereals do not occur in this context. The advance sale of the vintage is also attested in the mid-first century AD. The grammarian Q. Remmius Palaemon bought estates near Rome and invested money in their improvement. According to Pliny, the productivity of the vineyards was raised spectacularly. At one time, Palaemon sold his unharvested vintage for HS 400,000.⁸⁵ Finally, the *Digest* refers to the sale of unharvested grapes and olives. Regarding the first, it is implied that the purchaser took care of the harvest and the subsequent processing of the grapes.⁸⁶

One may also point to the so-called 'sales on delivery' in Egypt. By far the most cases deal with agricultural produce, in particular wine. What happens in such transactions is basically that one party gives a certain amount of money and in future will receive a certain amount of goods. Roger Bagnall distinguished several types of such transactions: (1) the amount of money and the amount of goods are specified; (2) the amount of goods is specified, but the amount of money is not; (3) a more complex type specifies the amount of money received, to be repaid in kind at a price to be determined at the time of repayment. The future price is based on the market price current at the time of payment, but reduced by a third. Bagnall observes that the third type amounts to a loan in money to be repaid in kind at an interest of 50 per cent. He also points out that the first two types could in fact amount to the same kind of transaction. Since they do not mention a price, there is no indication of a rate of interest. The transactions of type three have a rate of interest of 50 per cent in common with loans in kind to be repaid in kind.⁸⁷ These features induced

82 Cato, *de agri cult.* 144.2.

83 Julianus *Digest* 18.1.39.1.

84 Cato, *de agri cult.* 147.

85 Pliny, *Hist. nat.* 14.50.

86 Julianus *Digest* 19.1.25; 18.1.39.1; Africanus 47.2.62.8. See also Kehoe (1997) 212.

87 Bagnall (1977) 94 includes the loans in kind that are repaid in kind at an interest of 50 % as a particular type of the same transaction. I have altered Bagnall's arrangement of types. Cf.

Bagnall to interpret them as a form of credit, not as advance sale of goods. Since the Roman authorities forbade a rate of interest of more than 12 per cent on monetary loans, the only way of extending and receiving a loan of money at a higher rate of interest was to repay it in kind. The above transactions hide the fact that a rate of interest of 50 per cent is paid.⁸⁸ In practice, the difference between 'sale in advance' and 'loan' in these cases is very small. In both cases, the farmer received money and had to hand over part of his crop after the harvest.

Pliny and the advance sale of wine

An important source on the advance sale of wine consists of one of Pliny's letters, in which he describes in detail the remittance of part of the price that the merchants had paid:

I had sold my vintage to the merchants (*negotiatores*) who were eager to purchase it, encouraged by the price it then bore, and what it was probable it would rise to. However, they were disappointed in their expectations.⁸⁹

Since Pliny's addressee was undoubtedly familiar with advance sales of wine, Pliny could be rather vague on the exact workings of this transaction. The question is whether Pliny sold the entire harvest at a fixed sum, or whether he sold a certain amount at a fixed price per unit. Neville Morley advocates the first option, which assigns all the risk to the merchants: 'By buying grapes on the vine, the *negotiatores* gambled on the size and quality of the harvest, and on the state of the market when the wine was ready.'⁹⁰ The fact that Pliny sold his harvest to significantly more than one merchant makes it an unlikely assumption that Pliny sold the entire harvest, irrespective of its size. It would mean that he sold a still unknown volume of wine at a fixed price to many individual merchants, who had to agree on some kind of ratio of distribution among themselves. The main argument that rules out this option is that Pliny regularly complains about bad grape harvests.⁹¹ Selling the entire crop at a fixed sum would mean a secure income, irrespective of the size of the harvest,

Rathbone (1991) 193–95; Kruit (1992) 167–84; Sharp (1998) 149f; Jördens (1999) 131f; Rowlandson (1999) 150f.

88 Bagnall (1977) 94f.

89 Pliny, *Ep.* 8.2.1. See Kehoe (1989) 559ff; Kehoe (1997) 216f.

90 Morley (1996) 162. Similar, Kehoe (1989) 562.

91 See the list in De Neeve (1990) 371.

which makes Pliny's complaints hard to understand.⁹² One might argue that a run of bad harvests would lower the bidding of the merchants in future, but this argument cannot explain all the instances. See for example the following letter:

... You wrote me word that the yield of your vineyards had been so poor, that I might be assured you would have time, as people say, to read a book. I have received the same bad accounts of my own little farms; and am myself therefore at full leisure to write books for you, provided I can but raise money enough to furnish myself with good paper.⁹³

Of course, the latter remark is an exaggeration, but the joke implies that the bad vintage directly threatened Pliny's income.

Hence, the second option seems to be the most likely: Pliny sold a fixed amount at a fixed price.⁹⁴ In this case, the merchants did not run the risk of a failed harvest, but only of a low selling price due to bad quality or adverse market conditions. In the above case, not the harvest, but the market situation caused financial losses, as the prices failed to meet the merchants' expectations. Hence, there is no reason to assume that the vintage had failed in this particular year, or that Pliny had not made a good profit.⁹⁵ Failed grape harvests were at the cost of Pliny himself and his tenants, leading to complaints when the vintage was meagre and causing financial hardship among the tenants, who found it increasingly difficult to pay the rent.⁹⁶

An important aspect of the sale of grapes on the vine was that the purchaser carried the risk of bad quality or deterioration. Cato's contract for the advance sale of wine contains no special clause regarding the quality of the finished product. This is quite logical, since the buyers had bought grapes, not wine. In contrast, Cato's contract for the sale of wine in vats stipulates that the wine should be tasted within three days.⁹⁷ The Roman jurists also paid much attention to the quality of the wine

92 One might argue that Pliny did not always sell the vine harvest in advance and that his complaints refer to years in which he used a different marketing strategy. However, as Pliny himself informs us, the remittance of part of the price was intended to keep the merchants satisfied, which implies regular dealings with the same people.

93 . . . *ut plane scirem tibi vacaturum, quod vulgo dicitur, librum legere. Eadem ex meis agellis nuntiantur. Igitur mihi quoque licebit scribere, quae legas, sit modo, unde chartae emi possint; quae si scabrae bibulae sint, aut non scribendum, aut necessario, quidquid scripserimus boni malive, debimus.* Pliny, *Ep.* 8.15.

94 Cf. the advance sale of a fixed amount of grain at a fixed price in *Digest* 19.2.19.3.

95 Contrary to De Neeve (1990) 371.

96 On the financial problems of Pliny's tenants and the introduction of sharecropping, see chapter one.

97 Cato, *de agri cult.* 147; 148.1.

and its deterioration after its storage in amphorae, *dolia* or vats. The crucial issue in these cases is the assignment of risk. Buyers usually bought wine subject to their approval. In order to protect the seller, in most cases a fixed term for the tasting was agreed. In addition, the seller could guarantee that the wine would hold its quality until a certain period.⁹⁸ The assignment of risk concerning quality and deterioration was the main difference between the sale of grapes on the vine and the sale of stored wine.⁹⁹

The transaction between Pliny and the merchants who bought the grapes before the harvest implies that each of the parties was driven by opposite considerations. The merchants acted upon the expectation that the price difference in time would offer them a profit. Pliny discarded the opportunity to make a larger profit in the future, and accepted the sum offered before the future market price was known. Pliny's approach to the selling of his crop is revealing. As Kehoe rightly emphasises, profit maximisation was not Pliny's primary aim. 'In passing risk for the market price of his wine on to the contractors, Pliny of course sacrificed the flexibility that would allow him to achieve a higher income by waiting for more favourable prices. Every year Pliny paid a premium for avoiding the risks associated with viticulture. In doing so, he reduced his yearly income, but his willingness to accept a reduced income emphasises his need for an income that would be more or less the same every year.'¹⁰⁰

Kehoe adds two further motives for the advance sale of the grape harvest: Pliny's need for ready cash and the reduction of managerial costs.¹⁰¹ These explanations are less convincing: Pliny had sufficient access to credit if he needed cash. If he needed money for his benevolent projects and other social obligations, he would have timed his expenditure to suit his income. More importantly, some of these merchants had not even paid at the time when Pliny returned part of the price: '... considering that some had paid either large or small instalments of the purchase-money, whilst others had paid nothing.'¹⁰² Rather than needing cash, Pliny had offered credit to some of the merchants. Secondly, a contract for the harvesting and processing of his crop would have sufficed, if he

98 In particular *Digest* 18.1.34-5; 18.6.1 pr; 18.6.4.1; 18.6.6. Yaron (1959) 71-7. Also Jewish laws dealt with this issue. See Ben-David (1974) 187f.

99 Of course, the latter could also pertain to transactions between middlemen and subsequent buyers.

100 Kehoe (1989) 567. Similar, De Neeve (1990) 379; Pleket (1993b) 338ff. Cf. Martin (1967 = transl. 1981) 223ff.

101 Kehoe (1989) 568.

102 Pliny, *Ep.* 8.2.6.

had merely wanted to avoid the trouble of supervising these activities. This is not to deny that Pliny gladly avoided the effort of the time-consuming inspection of the workers during the vintage, as is indicated by a remark concerning the vintage and processing in a letter in book nine:

The getting in of my vintage – which, though it has proved but a slender one this season, is, however, more plentiful than I expected – particularly employs me at present (*Ipse cum maxime vindemias, graciles quidem, uberiores tamen, quam exspectaveram, colligo . . .*). If indeed I can with any propriety say so, since I only gather a grape now and then, visit the wine-press, taste the must in the vat, and saunter to the townspeople (*urbani*), who, being now engaged in supervising the farmhands, have wholly abandoned me to my readers and secretaries.¹⁰³

Pliny clearly made a point of being present at the vintage, but his involvement was very limited, because the *urbani* had taken over supervision of the labourers.

The letter in book nine offers a point of crucial importance. One should carefully distinguish between the vintage (as in 9.20) and the sale of the wine (as in 8.2). De Neeve pointed out that it would have resulted in chaos if the many buyers had each taken control of harvesting and processing of only a small part of the crop. It also seems unlikely that the buyers had combined to let out a contract for the vintage and processing of the harvest. De Neeve was surely right to distinguish between the harvesting and processing of the crop and the selling of the wine. Hence, the *urbani* in 9.20 are not the same people as the *negotiatores* in 8.2, as was suggested by Kehoe.¹⁰⁴ De Neeve proposed that there were two separate transactions: Pliny let out a contract for the harvesting and processing of the crop (as in letter 9.20), while he had sold the wine in advance to merchants (as in letter 8.2).¹⁰⁵ Hence, according to this hypothesis there were two separate considerations involved: Pliny let out a contract for the vintage in order to avoid the cumbersome work of supervision, while he sold the crop in advance to avoid the risks of the wine market. However, the widely held opinion that the *urbani* were members of his own urban workforce, although this option was cursorily dismissed by De Neeve, seems to be most attractive, first, since it offers the most logical interpretation of the term *urbani* and, secondly, because there is nothing in the letter to suggest the involvement of contractors. Hence, Pliny remained involved in the vintage, but left most of the work to members of his urban

103 *Ibid.* 9.20.2. Regarding the *urbani*, see also De Neeve (1990) 378.

104 Kehoe (1989) 566, 578.

105 De Neeve (1990) 376ff, contra Kehoe (1989) 578ff.

staff. This also makes the most sense of a remark made in an earlier letter, where he said that he had no time to hunt, because the vintage was about to start.¹⁰⁶

The wine trade

Pliny's letter concerning the remission of part of the price to the merchants offers two important points concerning the nature of these *negotiatores* and their role in the wine trade. First, many merchants were involved in the marketing of the crop of Pliny's vineyard. Pliny offered additional percentages to those merchants who had bought for more than HS 10,000, which implies that a significant number among the merchants had spent less than this amount. While the sources offer few quantifiable data to put this sum in perspective, it is clear that HS 10,000 is a moderate amount.¹⁰⁷ It is sometimes argued that the small amounts of Pliny's wine that were bought by the merchants need not imply that the *negotiatores* were small-scale merchants. It is proposed that these merchants bought part of the wine of many estates, thereby spreading their risk.¹⁰⁸ However, the risk they bore was not that of a failed harvest, but that of low prices in the consumer market. Low prices at Rome (or elsewhere) occurred when the market was oversupplied or when some crisis caused a decline in demand. This risk could not have been avoided by buying small quantities at several estates. It seems most likely that the merchants in Pliny's letter handled only relatively small amounts. Hence, the marketing of Pliny's wine seems to have been on a rather small scale.

There is one famous example of a merchant bringing wine to Rome on a large scale:

I built five ships, got a cargo of wine – which was worth its weight in gold at the time – and sent them to Rome. You may think it was a put-up job; every one was wrecked, truth and no fairy-tales. Neptune gulped down 30 million in one day. . . . I got another cargo of wine, bacon, beans, perfumes and slaves. . . . I made a clear 10 million on one voyage.¹⁰⁹

However, this was no ordinary trader: the fictive freedman Trimalchio surpassed everyone in the scale and boldness of his actions. Getting rich from the legacy of his former master, he put all his eggs in one basket in order to make a quick profit from current market conditions in Rome. The

106 Pliny, *Ep.* 9.16.1.

107 Cf. Kehoe (1989) 571.

108 *Ibid.* 572.

109 Petronius, *Sat.* 76.3–7. See D'Arms (1981) 100f.

shipping disaster did not stop him: selling his wife's jewellery, he tried again and made a huge profit, which he promptly used to buy all his former master's estates. Trimalchio was undoubtedly not a typical trader, but this passage nevertheless contains two interesting elements. First, information on current market conditions determined the choice of product. Trimalchio bought wine, because that product offered a good opportunity for profit. Secondly, merchants traded in several goods. Trimalchio may have been typical in that he was not a professional wine merchant, but a trader in whatever goods promised a profit.

Trimalchio was a ship-owner; naturally, as a trader he operated on a certain scale. Varro mentions merchants who brought wine from the inland of southern Italy to the sea on a smaller scale:

The trains are usually formed by the traders (*mercatores*), as, for instance, those who pack oil or wine and grain or other products from the region of Brundisium or Apulia to the sea in donkey panniers.¹¹⁰

These merchants bought from farmers at the gate and either acted as middlemen for urban traders or overseas merchants (such as Trimalchio was) who brought the goods to consumer markets such as Rome or acted as overseas merchants themselves. Of course, the *negotiatores* who bought Pliny's wine had no need of mule trains, as the Tiber offered a more convenient way of transportation. The point is that the trade in wine (and other goods) was partly served by small-scale traders.

This is not to deny the existence of professional wine merchants and of the infrastructure that was required for a complex wine trade. The epigraphic evidence indicates the existence of *vinarii* and their corporations.¹¹¹ In the late first and early second century AD, there was a prosperous Forum Vinarium in Ostia, and a Portus Vinarius and several wine warehouses in Rome. The *Digest* mentions special wine-ships (*naves vinariae*) as quite common.¹¹² Actually, a wreck has been discovered of a ship in which 14 *dolia* were being transported, each with a capacity of 3,000 litres of wine.¹¹³ Nicholas Purcell has analysed the growth in the consumption of wine in Italy and its consequences for the cultivation of vines and the wine trade.¹¹⁴ The emergence of specialised wine merchants

110 Varro 2.6.5. See also the amusing story of wine merchants in Roman Palestine, who 'had heard there was an *angareia*' [confiscation of transport animals] and feared that their mules and wine would be confiscated. They left their wine in a grave outside town, where a drunkard drank it all. Cited in Sperber (1998) 52f.

111 D'Arms (1981) 128ff. On specialised wine traders in Egypt, Ruffing (2001b) 67ff.

112 Ulpianus *Digest* 47.2.21.5.

113 Galsterer (1990) 34.

114 Purcell (1985) 13ff. See also Jongman (1988) 97ff; Arthur (1991a) 155ff; Morley (1996) 135ff.

and of the infrastructure needed for a large-scale supply should undoubtedly be related to the scale of the market for wine in the city of Rome. It seems that Rome at least partly corresponded to the model offered by London and Paris. Nevertheless, the large market for wine and the complex network of market relations that emerged may have been partly served by many traders who individually operated on a relatively modest scale.¹¹⁵

Let us return to Pliny's letter concerning the marketing of wine. Despite the presence of a huge market in Rome and the ease of transport along the Tiber, Pliny regarded the service of these small-scale merchants as necessary for the marketing of the harvest. It may be pointed out also that the owner of the Appianus estate in Egypt had long-term contracts with wine traders, who sold the wine that was produced on the estate in local markets.¹¹⁶ The traders' importance to Pliny is shown by his efforts to maintain good relations with them. The point of the advance sale of one's wine was to reduce the risks involved in marketing. Attracted by possible profits, the merchants had willingly accepted that risk. It was only natural that Pliny's renunciation of a possible profit should be returned by the merchants' acceptance of a certain risk. Nevertheless, Pliny deemed it necessary to compensate the merchants for the losses they had incurred in their market gamble. Hence, his remission of part of the purchase sum went beyond any legal obligations.¹¹⁷ Not only did he offer a general reduction on the original price, he also offered an additional reward to the larger and more reliable buyers among them. Those merchants who had bought larger quantities and those who already had paid in cash received larger remissions than the others. The fact that Pliny agreed to deliver the wine to some of the merchants on credit by itself shows quite some leniency on his part. Pliny explicitly explained the remission in this way:

This was a proper way of my returning thanks to each of them for their past conduct, according to his respective merits, and at the same time tempting them all, not only to deal with me for the future, but to be forward in their payments.¹¹⁸

In view of his efforts, Pliny seems to have been happy to deal with a large number of small- or, at best, medium-scale merchants, who partly bought the wine on credit. De Neeve concluded that 'the negotiatores were

115 Cf. Millar (1981) 72: 'The economic functions of towns in a pre-industrial society can be complex and important on aggregate, even if the units of production and exchange are themselves small.'

116 Ruffing (2001b) 71f.

117 Kehoe (1989) 573f.

118 Pliny, *Ep.* 8.2.7.

indispensable for Pliny in that they provided him with access to the market.¹¹⁹ One may doubt whether there were many alternatives to vineyard-owners like Pliny, and whether the opportunities to sell one's harvest were as good as the presence of a large and accessible market as the city of Rome would lead us to believe.¹²⁰

Finally, Pliny not only sold his own wine, but also that of his tenants.¹²¹ In Roman Egypt as well, landlords used to sell the wine produced by tenants of vineyards.¹²² The reason for this has to be sought in the marketing relations. As indicated above, it was to the advantage of both parties that they could rely on each other year after year. This is confirmed by the evidence concerning the Appianus estate in third-century Egypt, where the same individuals recur during a number of years as buyers of wine.¹²³ In order to get the highest possible price, sellers like Pliny occasionally had to offer credit and additional advantages, such as the remission of part of the price. Individual tenants could not offer the same stability of supply or the necessary credit to merchants who were willing to buy at good prices. However, it was in Pliny's interest that his tenants should prosper. Kehoe says: 'Advance of the vintage to middlemen provided an important means of achieving this goal, since such sales made it easier for tenants to raise the funds necessary to pay their rent.'¹²⁴ Previous to Pliny's introduction of sharecropping, the tenants handed over to Pliny at least a part of the produce they wanted to sell, who paid them back their earnings, possibly after he had deducted their rent. However, a run of bad harvests resulted in widespread indebtedness among his tenants. After Pliny had introduced sharecropping, the tenants handed over part of their produce as rent, which he sold on the market, probably to largely the same merchants as before.¹²⁵

We may conclude that the advance sale of wine (and olive oil) was a common practice among market-oriented landowners in the Roman world. How common it was in proportion to the sale after the harvest to middlemen, large-scale merchants or directly to external markets is of course impossible to say.

119 De Neeve (1990) 379.

120 For the opposite impression, Morley (1996) 162f.

121 Thus, Kehoe (1989) 574ff. See also chapter one.

122 Rowlandson (1996) 232.

123 Rathbone (1991) 287–91.

124 Kehoe (1989) 579.

125 Cf. Kehoe (1989) 586.

The advance sale of grain

The advance sale of wheat in Roman Egypt is interpreted as a form of credit, whereby a part of the next crop was mortgaged at a high rate of interest. However, most of these transactions concern wine. It should also be noted that, in contrast to the rest of the Mediterranean world, both farmers and buyers in Egypt had a good idea of the quality of the next grain harvest, since the determining factor was the flood of the Nile that preceded the growth cycle.¹²⁶ This circumstance offered insight into the size of the next harvest and subsequent market conditions. The management of risk was thus less important than elsewhere. Bagnall sees loans in the form of advance sales as stemming from the need of farmers for cash at a difficult time of year, i.e. when reserves were lowest before the new harvest.¹²⁷ The Talmud mentions the advance sale of crops, including grain, in Roman Palestine. The crop is sold at a fixed market price. It is explicitly stated that the abundant market supply offered a guarantee to the buyer that the agreed amount would be delivered. In other words, the seller had to buy corn on the market, if his own crop turned out to be insufficient. The main advantage to the farmer seems to have been that a certain price was guaranteed, regardless of the current market price at the time of delivery. However, the farmer lost the opportunity to take advantage of market conditions at the time of the harvest. The buyer was certain of supply, although possibly at a price higher than the current market price at the time of the harvest. Sometimes both parties agreed on the delivery of goods over a certain period. In one particular example, a farmer is given credit in money against the delivery of part of his grain crop after the harvest.¹²⁸

The Roman and Greek sources usually approach farming and marketing from an elite perspective. Hence, they contain little information concerning the advance sale of grain. The sole reference, moreover, occurs in the special context of the relations between a landowner and his tenants. In early modern England, tenants usually sold their standing crops to the agents of large firms. 'For the tenant farmer the six-monthly rent day was a cause of considerable anxiety, and as it approached he opened his ears to suggestions of forward sales.'¹²⁹

126 Sharp (1998) 149f.

127 Bagnall (1977) 87.

128 These cases are discussed in Ben-David (1974) 193f; Rosenfeld and Menirav (2001) 355ff.

129 Chartres (1985) 472f. The need for cash in the months before the harvest also induced early modern peasants in Italy to sell their grain crop in advance. Reinhardt (1991) 179.

Contrary to the sale of standing crops to buying agents (as in England), the following rule from the *Digest* refers to the purchase by the landlord:

If in a lease the owner reserves that he will take a fixed amount of grain at a fixed price and the owner then refuses both to take the grain and to deduct the money from the rent, he can sue on the lease for the entire amount. But in that event it is logical to think it consistent with the judge's discretion that he assesses the extent of the lessee's interest in paying the reserved portion of his rent in grain rather than in money.¹³⁰

The 'normal' situation to which this case refers was that a landowner had agreed to buy 'a fixed amount at a fixed price' from his tenant. The payment involved was deducted from the monetary rent. The advantage of such a contract was that the buyer could be certain of a fixed supply, regardless of the harvest, while the tenant was sure to sell at least part of his crop at a reasonable price, irrespective of current market conditions. Each party bore a certain risk: the tenant had to sell below market price when harvests failed. In such a case, he would have been better off selling the crop himself and paying a fixed monetary rent. The landowner lost money when he had to buy above market price when the market was oversupplied. However, the security of income the landowner offered to the tenant by means of such a contract was to his own advantage in the long term, especially when, as Pliny wrote, good tenants were hard to find. Unfortunately, the text does not reveal when the amount and the price of the grain were fixed: whether this occurred each year, at some time before the harvest, or whether the amounts and their price were fixed for the entire duration of the lease. The latter case would indicate an even greater willingness on both sides to create stability in their market transactions.

The breach of contract dealt with in the *Digest* case occurred when the landowner refused to buy the stipulated amount, probably because of adverse market conditions resulting in a low price of corn. Since the purport of the contract was to offer security against market price instability, it was seen as logical that the judge should assess the tenant's interest in paying the rest of his rent in grain rather than money. This latter ruling indicates that the Roman lawgivers realised the impact of the instability of the market on the position of tenants.

Further ancient evidence concerning the advance sale of grain is unknown to me. It is therefore difficult to say how common the practice

130 Ulpianus *Digest* 19.2.19.3. See Kehoe (1997) 216f.

was. However, while the advance sale of one's crop was generally advantageous to tenants, who had to acquire the cash to pay rent, it was less so to freeholders, who were under less obligation to raise cash quickly. The main advantage of the advance sale of the grain harvest was that it offered security at an early date and offered cash at a critical time of year, i.e. before the harvest. Also in Palestine, the position of the buyers seems to have been better than that of the farmers, who had to bear the risk of a failed harvest. In early modern Europe, brewers who wanted to ensure an adequate supply of corn sometimes bought a cereal crop in the field. The farmers were obliged to deliver a certain amount, irrespective of the harvest, which often caused the financial ruin of small farmers.¹³¹ In general, one may assume that the advance sale of grain was more usual among tenants than among freeholding subsistence peasants. Tenants had most reason to sell quickly, in order to pay the rent. Moreover, a landowner who bought his tenants' harvest had good reasons to support them, while also gaining direct control of their income. Freeholding peasants did not offer such additional advantages to potential buyers.

The ancient sources do not mention the advance sale of grain by market-oriented farmers. However, the functioning of the advance sale of wine may offer some clarity. Passing on part of the risks of the wine trade – in particular the risks of bad quality and of an adverse market situation – was the main motivation for landowners to sell the grapes on the vine. When the vintage and pressing of the grapes and the storage of the must were included in the sale, the avoidance of the labour involved was a further motive. Pliny retained some of the risk of a bad harvest, as is witnessed by his regular complaints. The buyers took part in such a transaction, because it offered them an opportunity to make a profit. Advance sale, moreover, ensured them of a share in the market supply at an early date. In order to gain stability of income, landowners had to accept relatively low prices. Nevertheless, the merchants ran a certain risk.

The risks of the grain trade were different from those of the wine trade. Owing to the greater elasticity of demand, the price of wine was less subjected to heavy fluctuations than the prices of cereals. Moreover, wine did not rise in price (or at least not as much) in the course of the year.¹³² Large landowners had much more to gain by postponing the selling of the grain crop than by postponing the sale of the vintage. After a good harvest year, grain prices were low, but landowners were somewhat compensated

131 Pelizzon (2000) III.

132 On price elasticity and the price development of grain and wine, see chapter four.

by the larger volume of the harvest. In a bad harvest year, the high prices more than compensated for the decline in bulk, even more so when they were able to sell the rent that their tenants had paid in kind. However, merchants who bought a fixed amount of grain at a fixed price before the harvest were subjected to much larger risks than when buying grapes on the vine. In sum, the merchants were unwilling to run the risks involved and the landowners had little to gain by offering low prices in order to compensate for these risks. Hence, it is unlikely that the advance sale of corn was a common practice, which explains the silence in our sources.

PEASANTS AND THE GRAIN MARKET

Peasants who had a surplus to sell may have sold most of it to members of their own community, who had goods or services to offer which they needed or liked. The reasons to trade with neighbouring farmers and members of the same community were numerous, many of them depending on the last harvest and the prosperity of the household. Much of this trade may have been in kind. As far as neighbours and relatives are concerned, it may often have been hard to distinguish reciprocal help from market exchange. It may be stressed again that peasants often opted for other ways of using their surpluses than selling at the market, including gift exchange. There are two important points: peasants did not necessarily deal with urban markets or outside traders, although it is likely that they regularly did so. The degree to which they sold surpluses outside their own community will also have depended on their household's prosperity (foremost their access to land) and that of their community, their social status and functioning, the access to outside markets and their need for cash.

In so far as peasants dealt with outside consumers, we may distinguish at least five main ways in which peasants could sell their surpluses of corn, wine and olive oil: (1) direct selling to urban consumers at urban markets; (2) selling in town to urban middlemen and corn merchants; (3) selling to middlemen and merchants at the gate; (4) selling to itinerant traders at rural, usually periodic markets; (5) exchange with other small farmers in neighbouring regions. Obviously, these five options do not cover all possibilities.

(1) Whenever the Greek and Roman sources depict peasants selling their crops in nearby towns, they sell garden crops, like garlic, onions, vegetables and herbs, and not grain. An example is provided by Columella, who describes peasants visiting markets, selling their garlic and herbs,

returning with a full purse and tending their gardens while the grain ripens in the field.¹³³ The short poem *Moretum* (traditionally ascribed to Virgil, and dating to the same period) presents another small farmer who goes to town each market day, selling the produce of his garden.¹³⁴ Jewish sources from the Roman period refer to farmers selling vegetables, fruit, wool and milk in town.¹³⁵ Inscriptions from Asia Minor mention *collegia* of market gardeners.¹³⁶ Also the Egyptian papyri offer evidence of small-holders selling vegetables in town. A report of market taxes, which mentions individual sellers and the days on which they operated, mentions cucumber-sellers and a pumpkin-seller who sold their produce on only a few of the days covered. Hence, these were no full-time traders.¹³⁷ The question remains whether peasants sold grain directly to urban consumers. The silence in our sources seems to indicate that this was not the case – at least it indicates that grain was not perceived by the ancient authors as the typical ware of peasants selling goods in town. One reason for this was probably that urban consumers who bought their staple food daily did not buy corn, but bread, since the majority of the urban populace lacked the means to bake bread themselves. In turn, it was not profitable for peasant households to mill their corn and bake bread for the market on a regular basis. This would have been too time-consuming, while the scale on which millers and bakers operated offered them an important competitive advantage. Therefore, direct participation in the urban grain market, comparable to the selling of vegetables and the like, is unlikely.¹³⁸

(2/3) It is far more likely that peasants sold in bulk to local millers and bakers, and to traders. A passage from the Tosefta proves the participation of middlemen and outside investment in the grain trade in Palestine: if someone had received money from a second party to make a joint purchase of grain, the buyer should buy one kind of grain only and both should have a share in the entire stock they bought. Likewise, if the price of grain rose or fell, both parties had an equal share in all transactions.¹³⁹

133 Columella 10.311ff.

134 App. Verg. *Moretum*. Heinze (1960) 404ff.

135 Ben-David (1974) 189; Safrai (1994) 224. More examples are given by De Ligt (1993) 138f.

136 SEG 40.1187, 47.1656.

137 P. Köln V 228. Sharp (1998) 144.

138 Cf. Pelizzon (2000) 112, who notes that early modern small farmers lacked the carts, animals and storage facilities to play a role in the direct marketing to consumers. However, she also points out (p. 126) that many people living near cities like Madrid and Venice baked and sold bread on the urban market. One reason may have been that rural bakers were free from the taxes on milling and baking that were levied inside the cities. See for instance Reinhardt (1991) 85.

139 Ben-David (1974) 197.

Unfortunately, the nature of the seller and the scale of the transaction remain unclear. Apuleius' *Metamorphoses* contains a reference to a miller, who bought an ass at an auction and some corn in a neighbouring village, but again, it is unclear from whom and where (at the auction?) he bought the corn.¹⁴⁰

Apuleius also mentions a small garden farmer, who brought his vegetables to town each morning and sold them to pedlars, in order to return to his garden and attend to it the rest of the day.¹⁴¹ The implication is that he had no time to sell his produce himself. An oration by Libanius (dated to AD 385) on peasants who were pressed into transport service in late fourth-century AD Antioch sheds further light on this issue.¹⁴² Libanius tells us that peasants who came to sell their wares in Antioch were forced by the soldiers to use their pack-animals to cart away the rubble and debris that resulted from the clearing out of building sites of the city. The produce mentioned consists of cheese, wheat, barley and fodder. Libanius points out that the peasants often had to go considerably out of their way or wait until late in the afternoon to fulfil the soldiers' demands. As a result, they were on the road late at night, without having the money to pay for an inn or for fodder for their animals. Most interesting for our purposes is that the peasants, when selling their wares in the city, intended to leave as soon as possible. We may also infer that under such conditions peasants avoided unnecessary visits to the city.¹⁴³

A text from the *Digest* confirms that peasants usually left the selling of their wares to others:

If the actual farmers or fishermen have been ordered to bring things into a city to sell them themselves, the supply of corn will be interrupted when the country people leave their work. They ought, as soon as they have brought their wares in, to hand them over and return to their work.¹⁴⁴

The workers of the land in this third-century AD text were probably tenants, since somebody was in a position to order them to sell their wares, but that is of no consequence from our point of view. The author of the text, Callistratus, goes on to discuss a passage from Plato's *Republic* that deals with the advantages of having traders sell the farmers' produce at the town market. In the dialogue, in which the ideal city is described, it is remarked that farmers would remain idle if they were to wait in town in

140 Apuleius, *Metam.* 9.1.

141 *Ibid.* 9.32.

142 Libanius, *Or.* 50.2ff. Schneider (1983) 66ff.

143 Thus, Liebeschuetz (1972) 62.

144 Callistratus *Digest* 50.11.2. Cf. Dardaine and Pavis D'Escurac (1986) 297; De Ligt (1993) 221f.

order to sell their wares. No, is the reply: 'There are men who have taken note of this, and devote themselves to this service. In well-governed cities they are usually those who are weakest in body, and incapable of any other work.'¹⁴⁵ Plato makes a clear distinction between merchants, who travel from city to city, and 'food-sellers', who seem to have been petty traders of little status in fourth-century BC Greece.¹⁴⁶

A story referring to Roman Palestine sheds some light on the role of peasants in the small-town retail trade, although the peasants involved brought salt and not their own crops to market. Some donkey-drivers learned that a nearby town was short of salt and decided to make a profit from the situation. However, their leader cheated his companions by taking a load of salt on his ass to town, having told the others to wait until the next day, when he would have finished the ploughing of his land. Returning home the next morning, he met his companions who were on their way to town. When asked why he had deceived them, he replied:

Had we all gone together, the price would immediately have fallen to a low level. Now I have brought salt and before you get there mine will have been sold out, so that when you get there you can sell yours at a good price.¹⁴⁷

Since his own load was not yet sold out when he left town, it is clearly implied that he had sold his load to urban traders. The story also sheds light on the rather haphazard nature of supply to the traders in town of such an important commodity as salt, which was not only used to flavour food, but also to preserve meat and fish.

The sparse evidence indicates that peasants frequently left the selling of their garden crops to petty traders or small merchants. As the evidence concerning *corpora* of garlic-sellers indicates, even in small towns these petty traders showed signs of specialisation and permanency. At least some of them were organised professionals.¹⁴⁸ Alternatively, members of the small farmers' households, whose labour was not immediately required, undertook the day-to-day selling of garden crops and the like. In Petronius' *Satyricon*, an old woman sold vegetables from the countryside

¹⁴⁵ Plato, *Rep.* 371c.

¹⁴⁶ The second-century AD orator Pollux of Naucratis, *Onom.* 6.128 includes traders of vegetables and petty traders in general in a list of ignominious professions. Grassl (1982) 106. Equally disparaging is the statement in a Jewish source that petty traders would never see a sign of blessing. B Baba Kamma 27a. Quoted in Ben-David (1974) 189f.

¹⁴⁷ Midrash Psalms 12.1, ed. Buber pp. 104–5. Quoted from Sperber (1998) 17.

¹⁴⁸ CIL IV 202 = Schumacher 267; CIL IV 3485; OGIS 484 = Freis 87; *HA Sev. Alex.* 33. See Bowman (1986) 107; Sharp (1998) 143ff, on retail traders and food shops in Roman Egypt.

in the town, but it is not clear whether she was selling her own household's produce.¹⁴⁹

Selling their corn in bulk, peasants avoided the costs and labour involved in small-scale transportation and marketing. However, one may assume that the peasants' position on the market was not as good as that of estate-owners, especially after good harvests, when the rural market supply was bountiful. Because a degree of permanency was to the advantage of both parties, it seems likely that many buyers preferred to deal with the same sellers annually, the more so because they depended on a sufficient supply each year. Peasants, whose surpluses were very much subjected to the vagaries of the weather, offered less security as market suppliers than landowners who operated on a larger scale. Furthermore, unlike wealthy landowners, they could not offer credit to small-scale buyers. Grain merchants who operated on a large scale preferred to deal with middlemen or large-scale producers, because overhead costs were larger when dealing with numerous small-scale producers. Peasants will have been even more disadvantaged in relation to their wealthy neighbours, as the latter often dominated the urban and rural institutions of exchange.¹⁵⁰ Nevertheless, it is beyond doubt that peasants who had any surpluses to sell contributed to the supply of urban markets.¹⁵¹

(4) Opportunities to sell their corn were either in the town itself, where peasants visited grain dealers, millers or bakers, or at periodic markets, where buyers and sellers of agricultural produce came together. Libanius, for instance, remarks on the role of periodic markets in the villages near Antioch. Although he observes that the villagers on these occasions traded amongst themselves and thus had no need of the city, it is not ruled out that middlemen bought their surpluses of corn, wine, oil and other produce and sold it in Antioch.¹⁵² The upward movement of agricultural produce from rural areas to towns was one of the functions of high-frequency markets.¹⁵³ In his study of periodic markets in the Roman Empire, L. de Ligt sees two options: either peasants went to weekly markets in towns in order to sell their produce, or itinerant traders visited

149 Petronius, *Sat.* 7.1.

150 Interestingly, Forbes and Foxhall (1995) 78 point out that 'in the past' the peasants of Methana (Greece) only had limited opportunities to sell their agricultural produce. Cf. Rosivach (2000) 35. Cf. Scott (1998) 9.

151 Regarding the peasants' role in supplying urban grain markets, see also De Ligt (1993) 212f.

152 Thus, Liebeschuetz (1972) 74.

153 De Ligt (1993) 7. Cf. McMullen (1970) *passim*. See also Epstein (1994) 463, 470 on the function fairs had as intermediary between pastoral regions and grain-growing lowlands. See also Chartres (1985) 420ff on early modern England; Epstein (1992) 117ff on late medieval Sicily.

rural markets in order to buy up small peasant surpluses and sell these at urban markets. As he points out, the days on which frequent markets were held in the small towns and villages in Campania and in the region of Magnesia show that these markets were adjusted to each other in order to facilitate the traders who visited each of them. Hence, traders may have visited these markets on a regular circuit, bought up grain or other produce and sold it at the larger urban markets that were included in the system.¹⁵⁴ De Ligt admits that the sources do not mention pedlars who buy up rural produce at periodic markets, but in view of the nature of the sources, silence is no argument against this possibility.

In the early modern world, itinerant traders were important intermediaries in the market distribution of the surpluses of small farmers.¹⁵⁵ Itinerant traders occur in the ancient sources.¹⁵⁶ Texts from the Talmud offer some information on Roman Palestine. Ben David even assumes that the grain trade in Palestine was largely in the hands of itinerant donkey-drivers.¹⁵⁷ The Talmud and other sources refer to donkey and camel caravans that traversed up and down the region. We should not overestimate the size of such caravans. Egyptian tax lists that give details of the traders who passed custom stations in the Fayyum show that over 90 per cent of donkey caravans and 75 per cent of camel caravans consisted of three animals or less.¹⁵⁸ Along their way they bought and sold those wares that seemed to offer a profit, including agricultural produce. In turn, caravans offered an opportunity to local farmers to sell their wares. Peasants welcomed the opportunity to sell their goods, as is implied in the following: 'A caravan used to pass by and they [the farmers] used to abandon the cares of Israel and engage in business.'¹⁵⁹ The fact that the local producers were eager to use the opportunity to sell indicates that there were few good alternatives for them. More clearly referring to small-scale traders is the following text: 'If the donkey-drivers sought to buy wine and oil, one should not send them to someone who never sold wine and oil.'¹⁶⁰ Clearly, these donkey-drivers did not visit a periodic market,

154 De Ligt (1993) 115f. Cf. McMullen (1970) 339ff; Frayn (1993) 133ff; Mitchell (1993) I 242; Morley (1996) 166ff; Zelener (2000) 227; Bintliff (2002) 229. See also Epstein (1994) 468 on the functioning of fair networks in late medieval Europe.

155 Cf. Pelizzon (2000) 112 on the French *blatiers*.

156 According to McMullen (1970) 335 itinerant traders occur often in the epigraphic sources.

157 Ben-David (1974) 186, 190.

158 Sharp (1998) 196. Drexhage (1982) 76f provides examples of individual traders in the Fayyum, whose largest caravans consisted of four or five camels.

159 PT Sotah I, 17a. Quoted from Safrai (1994) 264.

160 BT Bava Mezia 58a. Quoted from Safrai (1994) 264. Also Ben-David (1974) 212.

but bought at the gate of the farms they visited. A similar picture emerges from a passage in Varro, describing the activities of merchants who used pack-animals to convey wine, olive oil and grain from the inland of southern Italy to markets on the Italian coast.¹⁶¹

(5) In the early modern Mediterranean world, peasants often participated in the food trade. In Spain, many peasants acted as muleteers in the slack period of the year in order to earn an income by transportation services. In part, they were hired by their wealthy neighbours and by church officials to transport their harvests and rents into town, to Madrid or to export harbours. In addition, some peasants had manufactured goods for the urban market, which they sold during the summer months. In short, many peasants traversed the country with their mules, transporting and selling goods. An example of these we have seen in the story of peasants/donkey-drivers who sold salt in a nearby town.¹⁶² Their leader is ploughing his land, and his companions agree to wait until the next day when he says he wants to finish ploughing first. The activities of peasant-traders also included the direct exchange of local surpluses with peasants in other regions. Peasants who had a surplus of grain, for instance, brought this to neighbouring regions, where they exchanged it for wine or olive oil, which they took home on the return trip. Most peasants in early modern Spain operated within a radius of 50 to 75 miles (80–120km). Some undertook one return trip to Madrid or to one of the main harbours annually. They played an important role in the trade of grain, wine and charcoal. Ringrose concludes that peasants contributed significantly to the exchange between the various regional subsistence economies.¹⁶³ Also in Sicily, part-time muleteers played an important role in transporting surpluses to consumer markets and to export harbours.¹⁶⁴

The ancient sources are inadequate to offer much evidence of peasant involvement in transport and trade in the Roman world. Nevertheless, it is likely that similar conditions in the ancient world to those in Spain and Sicily resulted in similar solutions to similar needs. The evidence of customs receipts and customs house accounts in the Fayyum gives an indication of the mostly small amounts involved in the movement of foodstuffs in Roman Egypt, which seems to point to the involvement of peasants rather than merchants.¹⁶⁵ In this context, one may also think of the farmer-sailor as described by Hesiod, who probably limited his activities to the waters close to Boeotia and exchanged his surpluses in

161 Varro 2.6.5.

162 See above and chapter two.

163 Ringrose (1970) 48ff; 71ff.

164 Davies (1983) 380.

165 Drexhage (1982) 83.

the agriculturally slack periods of the year, including the high summer, when the grain had been harvested and threshed.¹⁶⁶ Most importantly, such direct exchange between peasant producers did not involve intermediaries. The system could function because the cost of the labour involved was carried by the agricultural activities of these part-time tradesmen. Hence, in inland regions, which lacked the development to sustain extensive networks of middlemen and specialised merchants, peasants and landowners largely kept the food trade in their own hands.

CONCLUSIONS

The commodity chain at its longest involved producers, itinerant traders, merchants, urban sellers and consumers; at its shortest producers sold to consumers. The development of marketing structures must have differed according to location and to economic circumstances. However, the source-material for the ancient world, despite the many scraps of information, is too fragmented and superficial to allow the construction of clear patterns. On aggregate, the urban food market in the Roman world must have reached an enormous scale, leading to the emergence of an elaborate institutional and physical infrastructure. Large landowners like Pliny, whose estates produced staple foods for large urban markets, did not need to worry about the marketing of their produce, and could therefore leave part of such activities to others. Landowners sold grapes on the vine and olives on the tree. Markets in small towns in isolated regions were not capable of supporting a local network of contractors, traders, businessmen etc. It might be true that this left a larger degree of involvement and control to wealthy farmers, but it seems wrong to assume that the direct participation in transport and marketing by wealthy farmers was limited to inland markets.¹⁶⁷ The picture is complicated by the fact that large landowners distributed food for other reasons than marketing, when they fed their workforces and domestic staffs in both town and countryside from the produce of their various estates. Large landowners were sellers in bulk, which made it possible for them to deal with urban merchants directly, either at the gate, in nearby towns or at external markets. The role of small producers in supplying urban markets was much more limited. There is much evidence of peasants

¹⁶⁶ Recently, Wallinga (1993) *iff*.

¹⁶⁷ Cf. Pelizzon (2000) 115: in the peripheral zones of early modern Europe, the landlords had a large role in the initial marketing and transport of grain.

selling garden crops at nearby markets, but their primary crops, including grain, they probably sold to urban traders, millers and bakers. Peasants had less opportunity to sell directly to external markets, which required the role of itinerant traders, who bought the small farmers' produce at the gate or at periodic markets. Special circumstances apply to tenants, whose close relationships with their landlord allowed them to make use of the marketing opportunities that large landowners had. The role of peasants in the transportation and trade of grain, wine and olive oil is well attested for the peripheral zones of early modern Europe, which included much of the Mediterranean world, but unfortunately, there is no such evidence for the Roman world.

CHAPTER 4

Market integration: connecting supply and demand

INTRODUCTION

The economics of the grain market are dominated by a few important facts. First, grain is harvested once a year, but consumed throughout the year. This leads to an annual cycle of growth and consumption. Moreover, seed-corn had to be stored until sowing time. Secondly, the vagaries of the weather create heavy fluctuations in production, but the consequences of the weather are local and independent. The differences between separate years and separate regions bring in two further elements: time and space, the first regarding the inter-annual distribution of corn, the latter regarding its inter-regional distribution. Moreover, in the ancient world market supply was not so much determined by total harvest as by the amount of surplus production. Because the ancient yields were low and much of production was in the hands of smallholders, who consumed a large and inelastic part of their production, market supply fluctuated even more heavily than harvests.¹ The degree to which the market succeeds in compensating for harvest shocks (i.e. fluctuations in harvest size) is called market integration. There are two ways of compensating for harvest shocks: first, transporting surpluses to regions experiencing shortage; second, storing surpluses until the next harvest year, which is called carry-over. Regarding carry-over, storage as such is not important, but the degree to which part of the harvest of one agricultural cycle was carried over into the next. Only when part of last year's harvest is still left when next year's harvest turns out to be meagre, does carry-over provide some compensation. These basic facts determine the economic operation of the grain market.

Differences in the balance between supply and demand determine the value of a commodity in a certain place at a certain time. In a market

¹ Erdkamp (1998) 190ff.

economy, profits due to differing exchange values in time or space constitute the main incentive to store or to transport. It seems obvious that farmers and traders in the Roman world responded to harvest shocks by storing or transporting food. However, this price-driven exchange mechanism was hampered by the costs involved in storage and transportation. The initial costs faced by farmers and corn traders were high. Hence, they ran the risk of financial loss, if the expected rise in price did not occur. Moreover, information on distant markets was not readily available. Nor was it possible to predict many months in advance the outcome of the next harvest. As we shall see, long-term storage largely failed as a means to even out harvest shocks because of their unpredictability. 'The distinctive character of carry-over is that the time horizon of such an operation stretches into the unknown – next year's harvest – and further into the future. Trade, even long-distance trade, primarily concerned intra-year transactions in which uncertainty was less pronounced.'² In other words, regional shortages were more tangible to farmers and traders. Inter-regional trade possibly responded more eagerly than long-term storage to harvest shocks. Not only in the Roman world were farmers and traders faced with these dilemmas. Even in such a highly developed commercial economy as eighteenth-century England, the corn trade was considered a risky business.³ This is not to deny the scale of the grain trade. As in early modern Europe, grain was the largest single item of trade in the Roman economy.

Market integration is an expression of the degree and extent to which trade connected supply and demand. In general, early modern Europe is characterised by a low degree of market integration. It seems unlikely that the grain market in the Roman world performed any better to overcome the obstacles posed by the natural and human environment. A low degree of market integration in many parts of the Mediterranean world severely hampered the opportunities to sell surpluses in years or regions that experienced abundance. Owing to the unpredictable threat of harvest failure, reliance on the market for staple foods was a risky undertaking for the numerous peasants and smallholders. Thus, direct involvement in food production was the safest strategy for those who worked the land, even though producing goods or cash crops, while buying food on the

2 Persson (1999) 67. In the jargon of the economists: 'Although the economics of intertemporal price equilibrium is analogous to spatial equilibrium, the former is considerably more complex owing to the difficulty of predicting the future.' Sahn and Delgado (1989) 188.

3 Chartres (1985) 474f.

market, would have been more profitable on aggregate. Hence, the consequence of a low degree of market integration for many regions of the Roman world was to limit the extent to which the non-food sectors of the economy could grow.

Although the ancient sources provide neither sufficient data on harvest yields, nor any meaningful series of grain prices that could provide an acceptable indication of fluctuations in harvests, we may nevertheless safely assume that harvests varied tremendously between years of disaster and years of abundance. Modern figures for harvest yields in the Mediterranean give an indication of the measure of fluctuation of harvests in this region. 'Years of glut and severe shortage follow each other in a Mediterranean microregion, not only with alarming unpredictability, but in a sequence that may be quite different from that of adjacent regions.'⁴ The main cause for the extreme fluctuations is a combination of the variability of the climate and the marginal conditions of arable cultivation. Harvests would fail when rain came too late to provide moisture for the seed-corn, when heavy downpours damaged the germinating crop, or when the heat and drought of summer arrived too early to allow the ears of the grain to mature fully. Production strategies that were adapted to these natural conditions, such as diversification of crops and fragmentation of landholdings, would dampen the effects, but could not provide full protection.⁵ Each and every year, Cicero complained, the farmer was powerless and at the mercy of the weather: 'Farming is throughout a thing whose profits depend not on intelligence and industry but on those most uncertain things, wind and weather.'⁶ The success of the food market in dealing with these conditions depended on its capacity to compensate for harvest fluctuations in time and space – that is, through storage and transportation.

Market integration is not a new concept in ancient history, although it has been present in the modern literature only implicitly and usually with reference to distribution in space. It has been pointed out long ago that harvest shocks were a basic factor in trade. Hopkins saw it as one of the factors that shaped trade in antiquity: 'sharp inter-annual fluctuations of rainfall created local gluts and local shortages and stimulated unpredictable flows of surplus staples to unpredicted markets; hence small-scale (but in aggregate large-volume) inter-regional trade in staples, mostly

4 Horden and Purcell (2000) 152.

6 Cicero, 2 *Verr.* 3.227.

5 Foremost Garnsey (1988) 48ff; Gallant (1991) 34ff.

sea-borne.⁷ Hopkins, for instance, pointed to a passage in Philostratus' *Life of Apollonius of Tyana* to illustrate the workings of this 'unpredictable' trade: 'Traders roam from sea to sea looking for some market which is badly stocked.'⁸ Hopkins rightly stressed the importance of unpredictability.

As an expression of the degree and extent to which demand and supply correspond in space (and time), market integration is closely related to the concept of 'connectivity', which has been put forward by Horden and Purcell in their *The Corrupting Sea*: 'The *connectivity* of microregions. By this term, we understand the various ways in which microregions cohere, both internally and also one with another – in aggregates that may range in size from small clusters to something approaching the entire Mediterranean.'⁹ Food supply is a central aspect of the 'connectivity', because the distribution of food allows the division of labour within society. As their concept of connectivity rightly emphasises, the division of labour functioned at various levels: within households, connecting various subsistence strategies; within regions, connecting various sectors of the economy; and between regions, connecting regional suppliers and markets. All these levels operated simultaneously, creating a complex network of distribution. The means of distribution included free trade, but also rents and taxes, gift exchange, and the sharing of resources within productive units, ranging from households to holdings consisting of various estates. Hence, market integration is only one aspect – though an important one – of the connectivity within the food supply of the Roman world.

One further quote may be added: 'The bulk movement of essential commodities beyond the local market, whether basic foodstuffs such as grain, wine, olive oil and salt, or other essentials such as metals, wood for fuel and construction, other building materials and clothing, was stimulated by deficiencies, whether natural or man-made, permanent or periodic. The unequal distribution of resources from one region to another, the regular though not precisely predictable crop failures, the destructive or disruptive action of men and states, generated trade.'¹⁰ Peter Garnsey and Richard Saller rightly stress that demand is a central issue in the analysis of trade, and they make the important distinction between permanent and periodic deficiencies. As they surely realise, the distinction,

7 Hopkins (1980) 103. See also Halstead and Jones (1989) 54: 'Most records of a grain trade in both recent and ancient times in the Mediterranean probably reflect short-term conditions of surfeit and shortage.' Also (1983) 90. Cf. Pleket (1990) 43, 80.

8 Philostratus, *Vita Ap.* 4.32.

9 Horden and Purcell (2000) 123.

10 Garnsey and Saller (1987) 50.

important though it may be, cannot be made strictly. However, although the distinction cannot always be clear, a model of market connectivity should nevertheless distinguish between structural markets and regions that are occasionally deficient because of adverse harvest shocks.

Connectivity by means of trade actually consisted of a 'chain' of smaller 'connectivities'. The longer the distance and the larger the scale, the more links there were in this chain. The limitations of market integration are partly due to the fact that the various segments of the chain each acted according to their own goals and considerations. These considerations were shaped in an environment that often made 'connectivity' difficult and hazardous to realise. As so often in a pre-industrial economy, risk minimisation by the individuals involved, who hesitated to rely on the market, added to the technical problems in realising the integration of supply and demand. Sometimes it required the power of the state to overcome these problems and to side-step the considerations of the individuals involved.

The following chapter will elaborate on the ideas of market integration and market failure: first, the element of time, in particular the determinants of the corn price within the annual price cycle, which will lead to a discussion of the degree of storage in ancient agriculture, the incentives and obstacles regarding carry-over, and an assessment of the profitability of commercial farming. Section [two](#) will concentrate on space. To what extent was trade capable of compensating for local gluts and shortages? Did cheap overseas transport give rise to an integrated market across the Mediterranean Sea?

MARKETING IN TIME

Price volatility and price cycle

A characteristic feature of food prices in all pre-industrial societies is their volatility. Even a minor disruption of supply could cause prices to multiply. The data on prices of various products in the ancient world remain very inadequate. Price analyses, such as those current in early modern economic research, are not a viable option for the ancient historian. Many of the prices mentioned in our sources are either a product of governmental price regulation or they reflect extreme situations; most are exceptionally high prices in times of dearth. While the latter prices illustrate the extremely volatile nature of food prices in the ancient world, price volatility was not just related to bad harvests or

market disturbance. As we shall see, significant price fluctuations within the year were a normal phenomenon, not related per se to bad harvests or market failure. The high degree of price volatility should of course be related to the limitations of the ancient market, but that is only half of the answer.

Basic economic theory rules that the high instability of corn prices was largely caused by the inelasticity of demand in relation to supply. The diet of all people in the Roman world (and much of pre-industrial Europe) consisted primarily of cereals: wheat for the better-off people and the inhabitants of cities, barley or millet for the less fortunate.¹¹ Moreover, for most of the people, consumption levels were not high. Consequently, if market supply declined, there was little scope to reduce consumption. Few substitutes were available, in particular in the cities.¹² Hence, demand remained at about the same level, regardless of any diminution of supply. Conversely, the increase of supply also hardly changed consumption levels of primary foodstuffs, although it improved purchasing power and thus altered spending patterns. Third-century Egypt offers an interesting example in this regard: when the price of corn was low, workers in a workshop, who earned their wages in kind, rejected even an offer of one and a half times the agreed wage.¹³ Only the poorest people were likely to increase consumption when the price of corn was low; most consumers profited by increased spending on goods and foodstuffs that were more luxurious. In short, the demand for food in the Roman world was characterised by its low price elasticity, leading to extremely high prices in times of dearth.

The eighteenth-century French economist Turgot refined the theory of price inelasticity of food by introducing the idea of a downward-sloping demand curve as prices increased. He argued that the demand for corn was indeed very inelastic in a situation of adequate supply, but that demand became less inelastic when prices increased. When wheat became very scarce, prices would increase so much that consumers had to look for substitutes that were normally rejected for reasons of taste or status. Faced with extremely high prices, people would start to eat animal fodder or chestnuts. Hence, in a situation of extreme shortages, high prices would

11 Regarding the Hellenistic Greek world, Rathbone (1983) 46ff. Hamel (1990) 31ff discusses the various kinds of bread and other foodstuffs eaten by the rich and the poor in Roman Palestine. Cf. Amouretti (1999) 79ff; Corbier (1999) 128ff. See also chapter six.

12 Kohns (1961) 35f.

13 P.Oxy. 14.1668. Bowman (1986) 109. On the volatility of prices in Egypt, see also Dirscherl (1999) 78ff.

lead to the emergence of substitutes in the consumers' diets. Thus, the inelasticity of demand was lowered.¹⁴ Turgot's theory undoubtedly applied not only to early modern France, but also to the Roman world. For instance, during a shortage in the town of Aspendus, described by Philostratus, vetch was sold on the market.¹⁵ Moreover, the agricultural writers praise several kinds of fodder as a means to ward off starvation in times of dearth.¹⁶ As far as alternatives were available, substitutes diminished inelasticity of demand during severe shortages. One may add that lack of spending power further reduced the extent to which prices could rise. Although inelasticity of demand would mean that people were willing to pay almost any price in order to survive, there was little point in increasing price levels beyond the means of the consumers.¹⁷ Hence, both Turgot's theory of a downward-sloping demand curve and the limitations of purchasing power meant that price rises were more restrained than straightforward inelasticity theory would predict. That being said, it is clear that prices soared at any disruption of supply, while they reached bottom levels whenever the market was oversupplied.

The changing levels of supply and demand within each year, which are due to the fact that corn is harvested only once a year but consumed throughout the year, are reflected in the annual price cycle. Prices were lowest at harvest time, gradually increasing towards a high point just before harvest. Evidence concerning Classical and Hellenistic Greece and Roman Egypt shows that prices were about twice as high in spring as in summer.¹⁸ Such a price difference is confirmed by a passage in Cicero's *Verrines*, which also makes clear that this was a normal phenomenon in the Roman world. In this passage, Cicero contrasts the price-setting of two Roman officials. Roman provincial magistrates were authorised to requisition corn from their provinces for their own and their staff's needs. The communities that were required to supply the grain were entitled to request that they provide money instead, in which case the price was determined by the magistrate. Originally, this measure had been devised on behalf of those provincial communities that would have had to buy

14 Persson (1999) 13.

15 Philostratus, *Vita Ap.* 1.15.

16 On alternative food in times of dearth: Columella 2.9.14; 2.10.1ff; Pliny, *Hist. nat.* 18.127; Galen 6.620.

17 On the extent of price rises during shortages, see in particular Wrigley (1989) 247, 253f. On price elasticity, also Jongman and Dekker (1989) 116f; Jongman (2000b) 275f.

18 Garnsey (1988) 24; Duncan-Jones (1990) 144ff; Drexhage (1991) 18f; Reger (1993) 308ff. For criticism of Reger's figures, Sosin (2002) 137f. Rathbone (1997) 195 says that there are too few wheat prices dated by month to show reliably a seasonal pattern in Egypt. On seasonal fluctuations of prices in Hellenistic Babylonia, Van der Spek (2000b) 296.

corn on the market and/or wanted to avoid high transportation costs. Cicero accuses the former governor of Sicily, C. Verres, of abusing this measure. The accused will try to refute this accusation, Cicero says, by pointing to similar measures taken by two previous magistrates, Sacerdos and M. Antonius. However, as Cicero explains, while each had established exactly the same price of three *denarii* per *modius*, there was a big difference between their behaviour:

Sacerdos, upon reaching his province, did requisition grain for his maintenance. The price of wheat, before the harvest was reaped, being 5 *denarii* a *modius*, the communities asked him to commute the corn for money. The price at which he did so was considerably lower than the price current in the market: he asked only 3 *denarii* a *modius*. You see, Verres, that owing to the differences of the seasons the same commutation rate justifies us in praising him and in prosecuting you: it indicates beneficence on his part and oppression on yours. In the same period the praetor Antonius commuted at the rate of 3 *denarii* after the harvest, when the corn was at its cheapest, and when farmers would rather have supplied the corn for nothing. . . . One should always regard the whole question of corn values in relation to the seasons and the current market prices (*annona*) . . .¹⁹

Not only in this particular case, Cicero writes, but each and every time one should take into account the current market prices when determining the conversion price of wheat. It is thus clear that the different price levels were not caused by particular circumstances, but reflect general differences before and after the harvest. A further example is provided by a shortage in Antioch in AD 362–3. In his *Misopogon*, the emperor Julian describes the measures he took in order to alleviate the crisis:

I gave to the city corn which had been brought for me from Egypt; and the price which I set on it was a silver piece, not for ten measures but for fifteen, that is to say, the same amount that had formerly been paid for ten measures. And if in summer, in your city, that same number of measures is sold for that sum, what could you reasonably have expected at the season when, as the Boeotian poet says, 'It is a cruel thing for famine to be in the house.' Would you not have been thankful to get five measures for that sum, especially when the winter had set in so severe?²⁰

Julian emphasises that the price he had determined had been appropriate for summer and should thus be regarded as very low for winter.

¹⁹ Cicero, 2 *Verr.* 3.214–15. Cf. Pritchard (1972) 652f.

²⁰ Julian, *Misop.* 369b. Julian's habit of varying the terms he uses for units of monetary value and measurement obscures the point he makes. Esp. Wiemer (1995) 329ff, with references. On the shortages in Antioch, see also chapter six.

The high prices do not necessarily reflect dearth or hunger in winter and early spring, although famine and starvation were most likely to strike at their severest at that time of year. The annual price cycle occurred because market supply decreased during this cycle, while demand remained stable, or even increased. At first sight, it seems strange that the market did not adjust to this situation. It would have been natural for farmers and traders to respond to the price cycle by reducing the amount of corn they put onto the market at a time when the prices were low in order to profit from higher prices later. Conversely, consumers should have profited from low prices at harvest time by buying sufficient corn to take care of their needs until the next harvest. In this way, the workings of the market should by themselves have evened out most of the price differences.

The explanation for the failure of the market to smooth away the annual price cycle has to be sought in the limitations to the behaviour of the various groups that bought and sold grain on the market.²¹ The annual price cycle was not only a feature of the Roman world or early modern Europe; it still determines the market of staple foods in developing countries. A recent study of Mozambique concludes: 'The regularity and rapidity of seasonal grain price increases in Mozambique indicate both a constrained ability on the part of smallholders to hold stocks and a strong desire for cash (likely to finance consumption) in the immediate post-harvest period.'²²

Let me start with the small farmers, who in normal years produced a small surplus. Many of these farmers faced financial obligations, such as the payment of rent, taxes or the repayment of loans, that forced them to sell part of their harvest as early as possible.²³ In addition, their financial reserves were at their lowest when the new crop was harvested, sometimes leading to loans and advance sales of crops.²⁴ Hence, the small producers

21 On this matter in early modern Europe: Hufton (1985) 122ff; Persson (1999) 70. Chartres (1985) 456 notes that the southern European growth cycle even affected English exports. However, in late 17th-century England, no clear seasonal pattern is discernible, indicating a significantly higher degree of market development (*ibid.* 457). Early modern Rome was another rare exception to the rule. During the 17th and 18th centuries, price development did not show a seasonal pattern, which was undoubtedly due to the extremely interventionist policies of the papal authorities. Reinhardt (1991) 309, cf. 451. On the causes of the price cycle in modern Third World countries, Sahn (1989) 9f.

22 Arndt *et al.* (2001). Cf. Sahn and Delgado (1989) 180: 'Seasonal price spreads for food are a widespread phenomenon in the third world.' Also Ellsworth and Shapiro (1989) 198ff.

23 In Egypt, for instance, rents, taxes and debts were paid immediately after the new crop had been harvested and threshed. Bowman (1986) 104f; Rowlandson (2001) 147.

24 See chapter three.

brought an – on aggregate – large amount of corn onto the local market just after harvest, resulting in low prices.²⁵ Even if they did not have to pay rents or taxes, small farmers did not have the financial reserves to postpone the sale of their surplus, which constituted their main source of income.²⁶ Marginal farmers added to the demand for grain, as their own harvest was gradually consumed and they needed seed-corn in spring. The situation was worse for those marginal farmers who had engaged in loans for consumption or seed-corn late in the previous cycle and had to repay them after harvest. These farmers had had to take loans when corn was expensive, while they had to sell when it was cheap.²⁷ Loans in kind partly avoided the adverse effect of the price difference. However, as the evidence of Egyptian papyri shows, the rate of interest on loans of wheat was still very large. Usually, the loan is made at the beginning of the Egyptian year (29 August) and had to be paid after the harvest (May). A papyrus concerning a loan from AD 325, for instance, stipulates the repayment of one half above the amount borrowed, which seems to have been the usual rate of interest.²⁸ The high rate of interest on loans of corn reflects the price difference between the time when the loan was made and the time when repayment was due, i.e. just after the harvest. Also the Jewish sources provide examples of farmers who borrowed money against part of the coming harvest, when grain prices were low.²⁹

In contrast, wealthy landowners had sufficient reserves to postpone the sale of crops until a time when prices were high. Such is also the advice of Varro:

As to the crops intended for sale, care must be used as to the proper time for taking out each. Thus you should take out and sell at once those which do not stand storage before they spoil, while you should sell those which keep well when the price is high. For often products which have been stored quite a long time will not only pay interest on the storage, but even double the profit if they are sold at the right time.³⁰

Wealthy landowners were not only selling their own harvest, but also the rent-in-kind that had been due after threshing. A fascinating papyrus

25 Duncan-Jones (1990) 148 points out that most sales of grain in Egypt occurred in the months from the harvest onwards, which 'reflects the fact that farmers tended to sell most of their crop soon after the harvest'.

26 Cf. De Ligt (1993) 137f.

27 See for instance McArdle (1978) 110f; Reinhardt (1991) 310.

28 P.Col. VII 176 = Rowlandson (1998) nr. 178. Bagnall (1977) 94 points out that a charge of 50% on loans in kind was common in Egypt through the centuries. Cf. Rowlandson (1996) 224.

29 Ben-David (1974) 194f.

30 Varro 1.69.1.

from the so-called archive of the descendants of Patron offers confirmation of this pattern. P.Mil.Vogl. IV 214 verso lists the amount of wheat in store after the harvest of AD 153 and its expenditure until the month of *Pachon* (April/May) the following year. The amount in store after the payment of taxes was 1028 13/20 *art.* (approx. 30 tonnes), which may possibly have been the entire wheat crop of the estate for that year. Until the late autumn, the store was depleted at a slow and steady rate. It is proposed that this represents the use of wheat for seed and allowances to labourers rather than the sale of wheat. However, during the early months of AD 154, that is, before the gathering of the next harvest, wheat is released at a much faster rate, including the sale of almost 200 *art.* (5,860kg) to a merchant in the month of *Pharmouthi* (March/April).³¹ The major risk in this game of waiting for the optimal price was that one was left with unsold stocks when the next harvest caused prices to drop again, and thus the value of old grain stores.³²

Also interesting in this regard is a remark made by Cicero, who accuses traders in the corn-supplying provinces of holding back their corn during a dearth in Rome until just before the next harvest, when the shortage would be at its severest.³³ On the other hand, merchants were limited in their marketing strategies by their short-term need of income. This is indicated by a passage in the work of Livy, who wrote that in 202 BC 'the supplies sent from Sicily and Sardinia lowered the price of grain so much that the merchant would leave his grain to the mariners to cover the freight.'³⁴ Clearly, in this case, the expectations of the merchants who had shipped grain to Rome had been thwarted by the unforeseen large shipments from Sicily and Sardinia. On arrival, the price of corn was much lower than they had expected. Interestingly, their response was not to wait until the price had risen, but to sell at slump prices. Their lack of storage facilities and of financial means forced them to take this short-term, but unprofitable course. Because of the high costs involved in shipment and trade, commerce was financed by credit. These commercial loans, however, were subjected to extremely high rates of interest. Hence, as in the above case, merchants were often forced to base their decisions on short-term considerations.

31 Sharp (1998) 95.

32 Sahn and Delgado (1989) 187: 'Farmers' behavior, like traders', is attributable to avoiding the risks of monumental losses that holding grain portends in intermittent years' (i.e. between years of high prices). In comparison, farmers in 18th-century central Spain sold most of their corn in the months March–June. Reher (1990) 157.

33 Cicero, *Dom.* II.

34 Livy 30.38.5.

Most consumers could not take much advantage of the low prices early in the price cycle, because they lacked the financial reserves for bulk purchases.³⁵ Tacitus emphasises that the populace of Rome was particularly fearful of any disruption of supply because they bought their food day by day.³⁶ A tradition in the Palestinian Talmud expresses the very same idea. As always in antiquity, autarky is depicted as good and market dependence as bad, but those who buy from a petty trader – so this passage goes – have no assurance of their life at all.³⁷ Moreover, most urban dwellers did not have the means to store large amounts of corn. The demand of the urban market therefore largely remained at a continuous level, despite the steadily increasing price.

Two groups had sufficient purchasing power to buy in bulk at times of low prices. First, the wealthy citizens, who only had to buy in so far as they did not bring in the necessary supplies from their own estates. Secondly, wealthy merchants and traders bought grain in bulk early in the price cycle, in order to profit from high prices in winter and early spring. The impact of bulk purchases in summer and early autumn was greatest when it was clear that the harvests had failed. Wealthy market-dependent consumers and traders would react to the expected supply problems by buying large amounts of corn at an early date, thus driving up the price and contributing to the panic of consumers before any actual shortages occurred.³⁸ Also the end of the sailing season (October/November) may have stimulated bulk purchases and hence driven up prices.

There was a precarious equilibrium between supply and demand that normally limited the rise of prices above the harvest price. There were too many suppliers involved for them to manipulate the market. There were sufficient suppliers of small or moderate means to ensure a steady supply in normal years. Farmers and merchants who tried to speculate by withholding their stocks from the market – not surprisingly, an ever-recurring

35 Already pointed out by Kohns (1961) 11f. A few attempts have been made to estimate the requirements and purchasing power of the common people. See Cherry (1993) 436ff regarding Rome in the late republic; Dirscherl (1999) 83ff regarding Roman Egypt. Dirscherl (p. 86) assumes that the volatility of prices induced the consumers in Egypt to buy large amounts for the long term. However, as his own estimates of purchasing power show, the average labourer's wages were hardly sufficient to feed a family at best of times. How did Egyptian wage-earners finance their bulk purchases? Reinhardt (1991) 90 points out that bulk purchases, usually on a monthly basis, were restricted to what may be designated as the 'middle classes' of early modern Rome.

36 Tacitus, *Hist.* 4.38.2.

37 Quoted in Hamel (1990) 34; Safrai (1994) 111; Rosenfeld and Menirav (2001) 368.

38 Fenoaltea (1976) 140f notes that storage stabilises prices, but that speculative storage in response to bad harvests forces up prices even more than no storage at all.

accusation in times of dearth – ran a double risk: if they waited too long, someone else might reap the profits, or social disturbances would force authorities to intervene, if rioters had not already taken matters into their own hands.

In sum: corn prices fell and rose steadily in an annual cycle that was related to growth cycle and harvest. The price movement was caused by the market behaviour of the various groups of producers, traders and consumers. Large numbers of small farmers were forced to sell their surpluses soon after harvest. Meanwhile, most consumers did not have the means to profit from the low prices by bulk purchases. The annual price cycle was not caused by dearth. The extent to which prices fluctuated annually was determined by the inelasticity of demand, causing low prices when the market was oversupplied and high prices when market supply decreased. Owing to the inelasticity of demand, a strained market due to a disturbance of production or distribution led to extremely high prices even before actual shortages occurred.

Storage and carry-over

Carry-over of surpluses in good harvest years diminished the effects of harvest shocks. Good harvests ensured that stocks were not empty when the next crop ripened. Carry-over of these stocks evened out annual fluctuations of production. This should not only have applied to commercial farmers or traders, for whom the low prices in a good harvest year were an incentive to store until prices rose again, but also to subsistence peasants, whose fear of dearth urged them to keep their crops in store. It is commonly believed that considerations of risk minimisation induced ancient peasants and farmers to keep large stores above a year's requirement as a buffer against bad harvests.³⁹ Regarding modern Greece, for instance, it is pointed out that farmers, who worked under unfavourable conditions, aimed 'to keep enough food staples (wheat and olive oil) in storage to ensure sufficiency if the following harvest should fail. In the case of wheat, this means a minimum of two years' supply.'⁴⁰

39 Garnsey (1988) 53ff; Halstead and Jones (1989) 51f; Purcell (1985) 169. Regarding Egypt, Alston (1998) 172f. Bergqvist (1993) 129 offers the curious argument that fallowing doubled the amount of grain that farmers had to have in store. Estimating the storage capacity that Cato needed to store the grain that was grown to feed his staff, Bergqvist argues that 'he needed *dolia* for one year's harvest to cover a two years' demand of his staff for grain'. Even assuming that Cato practised fallowing, this does not mean that he grew grain only every other year.

40 Forbes (1989) 93.

Although it is not denied that inter-annual storage among the peasantry alleviated the impact of bad harvests, the extent to which peasants generally held stores – and thus the extent of carry-over – should not be overestimated. The argument of the ‘prudent farmer’, who kept large stores, is based on very limited ancient evidence, largely referring to ancient Greece. A passage in Hesiod’s *Works and days* (476), expressing the desirability of stores to provide food until spring, is often mentioned. Clearly, Hesiod does not refer to carry-over. In his study of risk minimisation strategies in ancient Greece, Gallant points to the law of the Greek town of Selymbria, which required private persons to hand over any corn they had above their needs for one year. Gallant concludes that ‘left on their own people would have kept more than one year’s supply on hand’.⁴¹ However, it seems not very logical to assume that behaviour that is forbidden by law is the most natural. Law forbids drunk driving, but we may not conclude that without such a law most drivers would be drunk. Rather than assuming that this law limits the ‘natural’ impulse of people to store large amounts of corn, one should interpret the law as discouraging the gathering of what were perceived as excessive stores by individuals whose speculation endangered the ‘proper’ workings of the market. As so often, this law forbade what custom condemned. It is a different matter whether it was wise to discourage or forbid carry-over. Even if it is conceded that not only Archaic Greek farmers, but also those in the Roman world preferred having ample food stores, this does not prove that they generally did.

Archaeology also provides little evidence of large stores held by ancient peasants.⁴² Gallant provides the example of a typical house in Olynthos, containing four *pithoi* holding 800–900ltr, which was, according to Gallant, equivalent to 10 to 13 months’ corn for a typical household. Apart from the fact that this is merely what was needed from one harvest to the next, it reflects maximum storage capacity. In other words, 800–900ltr may have been the maximum capacity regularly required, but that is not to say that it was the average amount of food annually held in store. Gallant also forgets that seed for corn and other crops had to be stored as well. In general, archaeology is of limited use, since it is often impossible to determine the purpose of containers and their economic use. In addition to *pithoi*, food may have been stored in perishable

41 Gallant (1991) 95, referring to Ps.-Aristotle 1348b1–1349a3. See also Jameson (1983) 8, 10.

42 On limitations of archaeological evidence in this regard, Osborne (1987) 70; Dyson (1992) 137. Also, Spurr (1986) 81; Gallant (1991) 96.

containers, which remain archaeologically invisible. Moreover, one may wonder whether the house in Olynthos can be regarded as a typical peasant dwelling. As far as we can judge from the literary sources, peasants did not have elaborate storage facilities. The peasants in Dio Chrysostom's seventh discourse describe their dwellings as 'two pretty huts, and a third where the grain and the pelts are kept'. The poor man in pseudo-Virgil's *Moretum* also simply had a heap of corn on the floor.⁴³

The argument that most peasants held little or no stores at the end of the annual growth cycle is supported by the general depiction of late winter and early spring as a time of rural poverty and hardship.⁴⁴ For instance, Caesar relates the problems of his army in the spring of 49 BC in Spain partly to the fact that supply routes were blocked by flooding. Furthermore, Caesar says, it was just the time of year that winter stores were exhausted.⁴⁵ The second-century AD physician Galen states that rustics ate acorns and similar substitutes in late winter and spring, while Columella mentions the role of dried fruit in the rustics' wintertime diet:

If there is a large quantity of them, they provide the country folk with not the least part of their food during the winter. For they serve instead of a relish, as does the fig, which is dried and stored away and helps the country folk in time of winter.⁴⁶

A large extent of carry-over among the peasantry seems incompatible with the general picture of a strained food supply during the months before the next harvest.

We started our discussion with the alleviating effects of carry-over after peasants had obtained a good harvest. Inelasticity of demand in itself may be seen as an argument in favour of a large extent of carry-over. Since there was no other use for the crops harvested, it might be argued, good harvests inevitably led to large stocks. To some extent, this is true. However, there were some alternative options for them to take. First, surpluses could be brought to the market, while the employment of labour external to the farm was reduced. Secondly, peasants usually grew various kinds of corn, including wheat, barley and millet, in addition to several legumes. While wheat was a good crop to market, barley and millet provided more security against drought. In good harvest years, peasants could have feasted on wheat and meat, and fed the less favoured

43 Dio Chrys., *Or.* 7.47; App. Verg. *Moretum* 13ff.

44 Regarding ancient Greece, Sallares (1991) 74.

45 Caesar, *Bell. civ.* 1.48. Cf. Xenophon, *Hell.* 4.6.12ff; Polyaeus 4.6.20; Dionysius 5.26.2; 7.1.2.

46 Galen 6.620; Columella 12.14. Cf. Evans (1980) 138ff, esp. 140.

cereals and legumes to their animals. Conversely, in bad harvest years, animals were slaughtered because the members of the household needed the lesser corn and legumes to supplement their diet. In this sense, animals provided a means for rural dwellers to diminish inelasticity of demand. Thirdly, there was also the option of increasing seed density or sowing cereals on marginal soils in an attempt to enlarge next year's harvest. In short, the diverse means of support that sustained peasant households resulted in some elasticity of demand: good harvests led peasants to discard other means of support and to improve their standard of living. Thus, good harvests may only partly have resulted in increased stocks beyond the next harvest.

The considerations of wealthy farmers regarding storage differed from those of smallholders. Not forced by lack of either financial reserves or credit to sell their crops early, market-orientated farmers were stimulated by the annual price cycle to store. However, the question is whether wealthy farmers held sufficient stocks beyond the next harvest to alleviate harvest shocks. Storage could be intended for more than one year, as is shown by Columella's account of the threshing and further preparation of grain that is to be stored:

The pure grain, if it is being laid away for a term of years, should be threshed again, for the better it is scoured the less it is preyed upon by weevils. But if it is intended for immediate use, there is no need for a second cleaning and it is sufficient that it be cooled in the shade and so carried to the granary.⁴⁷

W. Scheidel reads this passage as advice 'to keep grain back for years if necessary in order to maximize sales profits'.⁴⁸ However, maximisation of profit is nowhere mentioned in the passage, which merely says what to do when grain is stored for years – for whatever purpose. Technically, grain could be kept for a number of years, and there are some indications of long-term storage in antiquity. Columella, for instance, mentions the long-term storage of millet and lentils.⁴⁹ Caesar mentions that during the siege of Massilia, the city's population had to subsist on old and

47 Columella 2.20.6. Cf. Theophrastus 8.11; Varro 1.63; 1.69.1.

48 Scheidel (1994a) 162. Also Spurr (1986) 79ff seems to assume that wealthy landowners generally stored their crops for more than one year. In medieval Sicily, grain was stored for periods of up to three years. Epstein (1992) 143. For early modern Europe, see Thompson (1971) 90, 93f; Reher (1990) 157; Persson (1999) 70. Reinhardt (1991) 157n. 43 observes that in early modern Rome, wheat was stored in public granaries on average for two years and four months, but that the quality of stocks declined rapidly when stored too long. Galsterer (1990) 33 states that grain can be stored for up to two years under favourable conditions.

49 Columella 2.9.19; 2.10.16.

mouldy stocks of corn. Egyptian papyri provide indications of the storage of corn for several years. A papyrus from AD 157/8 from Theadelphia, for example, contains the record of payments to the guild of owners of pack animals for the transport of grain from the harvests of AD 152/3 to 155/6. This may possibly indicate that the grain involved had been stored for years before it was transported to Rome. However, long-term storage of public reserves is no indication of the commercial storage of corn for more than one year.⁵⁰

The annual price cycle provided the strongest incentive for commercial farmers to store. However, while storage was profitable up to a certain point, farmers and merchants had little reason to intentionally hold on to stocks after the next harvest. Large-scale storage meant investment and risk to begin with, against the promise of later profit. It required investment in granaries, barns or other facilities, which needed regular upkeep. Keeping large amounts of corn in store only made sense commercially in so far as prices would rise over time. This was the case within each agricultural cycle. The annual price cycle offered sufficient certainty that investments would pay off. However, the same factor that provided the main incentive to store also constituted its main limitation: the price cycle depended on the growth cycle, and, thus, the next harvest would lower the corn prices again. There was no point commercially in holding on to stocks beyond the next harvest only to see their value drop significantly.

There was even less point in long-term storage, as costs were certain to increase. The cost of storage consists of three elements: direct storage costs, losses and the interest of invested capital, in other words, the opportunity cost. According to modern theory, 'opportunity cost represents interest income storage firms [in the ancient context: farmers or traders] could earn if they sold their grain and invested the receipts in other assets such as government bonds.'⁵¹ Opportunity costs cannot be generalised, since they depended largely on commodity prices, which in turn depended largely on circumstances of production and transport costs. 'The opportunity cost (interest foregone) of holding stocks declines as distance to the market increases. This means storage costs at two sites identical except for location will differ.'⁵² Opportunity costs are impossible to establish for the ancient world, but are considered by some as an

⁵⁰ P. Upps. 2 R, I. Husselman (1952) 72.

⁵² *Ibid.* 512.

⁵¹ Benirschka and Binkley (1995) 513.

important factor in limiting storage in early modern Europe and modern Third World countries.⁵³

The opportunity cost for peasants was severely limited by the fact that the wider economy offered them no secure alternatives. There were few investment opportunities for the little money they had. More importantly, the chance of making a profit did not outweigh the risks of having to buy when prices were highest.⁵⁴ Hence, owing to the inadequacies of product and capital markets in antiquity and early modern Europe, interest rates may not have played as large a role as in modern Third World countries. Another factor was that long-term storage inevitably caused losses due to insects, fungi and moisture, and the risk of theft or fire.⁵⁵ The amounts lost in antiquity due to deterioration during long-term storage are difficult to assess, but early modern and contemporary parallels indicate losses in the range of 10 to 15 per cent annually.⁵⁶ Furthermore, old stocks had less value than 'fresh' grain. Egyptian contracts for the borrowing of corn in kind therefore explicitly stipulated that the repayment had to consist of wheat of the new harvest.⁵⁷ Taxes had to be paid from the 'new' crop.⁵⁸ The Mishnah considered it fraud when sellers mixed last year's produce with the newly harvested crops.⁵⁹

An example may be added from medieval Egypt. We are told that before AD 1052/3, a large store of tax-grain used to be held by the state and

53 The role of the interest rate in the degree of storage in Europe has been the subject of considerable debate. Fenoaltea (1976) argued that long-term storage was the most effective form of assurance against harvest failure in medieval Europe. Hence, already in the Middle Ages, stores and the degree of carry-over were considerable. McCloskey and Nash (1984) rejected this, noting that storage was far too costly, owing to the high levels of interest rates in the Middle Ages. This notion was rejected by Komlos and Landes (1991), who deny that the interest rate had any economic relevance to the level of long-term storage. However, in Mozambique, the high rate of interest in rural areas contributes to the paradoxical situation that maize is largely stored in towns and sold back to rural areas when prices rise at the end of the price cycle. See Arndt *et al.* (2001). On a similar situation in Malawi, cf. Messer (1989) 157f, 161.

54 According to Komlos and Landes (1991) 38, peasants opted for security.

55 See in particular Columella 1.6.15. A scientific analysis of such ancient measures as smearing dung or *amurca* (a liquid left-over of the pressing of olives) on the walls of granaries is provided by Levinson and Levinson (1998) 140ff. Spurr (1986) 79f; Gallant (1991) 97f; Forbes and Foxhall (1995) 76.

56 According to Persson (1999) 70 the actual cost of storage was about 3–5% of the original value, while wastage amounted to at least 10%. See also Grantham (1993) 487n. 37. In modern Mozambique, spoilage amounts to between 0.5 and 1.0% per month. Arndt *et al.* (2001). Gallant's (1991) 97 estimation of 50–80% (annually?) is certainly too high. Thus, Forbes and Foxhall (1995) 74. In contrast, Fenoaltea (1976) 135, who argued that storage was the main form of risk management for medieval farmers, assumed that spoilage (estimated at a few percent) was of little concern.

57 See for example P.Col. VII 176 = Rowlandson (1998) nr. 178.

58 Sharp (1998) 246.

59 M.B.M. 4:11. Quoted in Neusner (1990) 87.

offered for sale on the market. The vizier informed the caliph that this arrangement was not only hard for the subjects, but also offered little profit, since grain was subject to price fluctuations and spoilage. Instead, the caliph was advised to establish an office that dealt with commodities that were more profitable and less subject to spoilage. Unfortunately, shortly after the caliph had followed the vizier's advice and sold the grain reserves, a low Nile resulted in severe shortages.⁶⁰

H. Forbes and L. Foxhall rightly observe that 'given the uncertainties in commodity prices on the one hand, and the steady decline in the quality of foodstuffs in store on the other, it is often not easy for the producer to decide the optimal – or even a good – time to sell.'⁶¹ They express surprise that, given this situation, none of the ancient authors of agricultural manuals have anything to say on the sale of their produce. However, it is hardly surprising: farmers were grain producers – not speculators, because that was an unattractive business.⁶²

In short, holding on to stocks beyond the new harvest only offered profit in so far as rising prices compensated for losses in bulk and quality. Such a situation occurred only seldom – and most importantly, unpredictably. While seasonality was cyclical and thus predictable, inter-annual variation of harvests and prices was random and thus unpredictable.⁶³ Risks were great, as pointed out by V. Reinhardt regarding large-scale farmers in early modern Italy: large amounts of unsold grain at the end of the harvest cycle were a dangerous mortgage that could spell bankruptcy if the prices fell only slightly more than usual during the next months.⁶⁴ Only when next year's harvest failed, would it be profitable to hold on to one's stocks, because such an event would break the annual price cycle. Natural causes of harvest failure often occurred quite early during the

60 Mayerson (1997) 204. Marketing of grain by the sultan or high officials became more rare in the Ottoman period. Faroqhi (1990) 135.

61 Forbes and Foxhall (1995) 77.

62 The same seems to hold true of their early modern successors: 'Römische Grosspächter [waren] alles andere mehr als Getreidespekulanten; der Akzent ihrer Tätigkeit lag entschieden auf dem Vermeiden von Risiken, nicht auf dem kühnen Wahrnehmen gebotener Gelegenheiten.' Reinhardt (1991) 336. He observes that their behaviour reflected that of the aristocratic landowners.

63 Cf. Sahn (1989) 14 speaks of a combination of trends, cycles and a stochastic element; the latter consisted of interannual harvest variation. See also Sahn and Delgado (1989) 187f.

64 Reinhardt (1991) 293: 'Grosse Posten unverkauften Weizens am Ende des Erntejahres waren eine gefährliche Hypothek, die Bankrott bedeuten konnte, fielen in den nächsten Monaten die Preise nur etwas kräftiger ab.' (Cf. 198f.) Admittedly, most commercial farmers in central Italy were large-scale contractors, whose financial situation may have been more vulnerable than that of Roman landowners.

agricultural cycle, and therefore farmers would sometimes know months before that harvests would fail. However, harvest failure could only play a limited role in any long-term planning regarding carry-over, since no farmer could possibly predict a year in advance the occurrence of a failing harvest. Because of the many months between the sowing of the one crop and the harvesting of the next, there was little indication of the future market price when commercial farmers had to determine their cropping strategy. Lacking any insight into future developments, farmers' considerations were made on the basis of short-run price movements. This is nicely illustrated by a remark made by Pliny the Elder, condemning speculative behaviour by landowners: 'The method of a good citizen and honest head of a household is to take the prices each year as they come. This is generally also the most profitable plan.'⁶⁵ Pliny's remark is given in the context of the processing and storage of wine, but it surely also held true regarding the grain market. Despite the moralistic overtones of Pliny's advice, it was not the landowners' inherent conservatism that shaped their caution, but their long-term experience.

Owing to the lack of information on the future development of the market, even in early modern Europe corn trading was considered a highly risky and speculative business. Concomitantly, the amount of carry-over in early modern Europe is estimated at about 5 per cent in a normal harvest year. In other words, 'carry-over was negligible'.⁶⁶ Long-term storage could never be a primary goal in the marketing strategy of farmers or merchants, since in more years than not the harvest would be sufficient and prices would subsequently drop. If stores were held by landowners over the next harvest, the explanation may have to be sought in considerations of consumption rather than marketing. In sum, in commercial terms, there was every incentive to build up corn reserves to last until the lean months of the year, but there was little purpose in accumulating stocks beyond that time.⁶⁷

⁶⁵ Pliny, *Hist. nat.* 18.320.

⁶⁶ Quote from Persson (1996) 700. Also, Ejrnaes and Persson (1999) *passim*, contra Nielsen (1997) 28: 'Early modern grain storage was an important factor in smoothing the effects of random shocks to the harvest.' Also in modern rural Mozambique, inter-annual storage volumes are small, which provides a nice counterbalance to the often stressed preference for large stocks among African tribes. Arndt *et al.* (2001) n. 5. In contrast, Fenoaltea (1976) 138f; Braudel (1990) 360; Epstein (1992) 143f; Forbes and Foxhall (1995) 75.

⁶⁷ Persson (1996) 701 concludes that 'in such a process of carry-over speculation only a few will survive since such expectations will only rarely be fulfilled. A substantial financial reserve and exceptional luck or exclusive information or market power would be needed to be able to survive for longer periods.' Hence, he (1999) 55ff rejects the ideas of Nielsen (1997) 13ff on 'profit maximizing storage'. See also Persson (1999) 67ff; Ejrnaes and Persson (1999).

Expected price differences between years seem not to have played much of a role in the marketing strategies of Roman farmers. Varro's advice to sell when the price is high should be seen in the relatively short term. Two examples may be given in support of this argument. First, the Roman jurists' view on food stores on Roman estates. Jurists may not have been agricultural experts, but Dennis P. Kehoe has rightly pointed out that their function required them to have sufficient knowledge of the agricultural practice on Roman estates.⁶⁸ Stores of grain on estates became an issue in Roman law when an estate including its equipment was legated. Jurists debated the point of what exactly fell under an estate's equipment. Ulpian's ideas regarding the grain stocks on estates are worth quoting in full:

It was asked whether grain, which had been intended for the rations of farmhands, would be included in *instrumentum*. The majority hold that it would not, because it would be consumed, whereas *instrumentum* comprises things collectively of longer duration without which possession could not be exercised. An additional reason is that food is prepared for nourishment rather than for purposes of cultivation. But I think that both grain and wine intended as rations are included in *instrumentum*, and his pupils report that Servius replied in that sense. Likewise, some have held that grain which was set aside for sowing was included in *instrumentum*, I think because it is involved in cultivation and is consumed in such a way that it is always replaced. And the case of seed-corn is no different from that of food.⁶⁹

Two kinds of grain stores are recognised by Ulpian: stores of seed-corn and those kept as food for the workforce. Similar is a ruling by the jurist Paulus, which concerned the legacy of an estate 'in the best and most complete condition'.⁷⁰ Again, only seed-corn and food reserves are mentioned. Stores of corn which were intended for the market appear neither in these passages nor in the rest of the extensive discussion of the bequest of farms.⁷¹ In view of the exhaustive listing of slaves, fields, furniture, tools and decorations in the relevant parts of the *Digest*, the silence regarding such stores is striking, even if it is clear that they did not strictly belong to the equipment. Also the consideration that the jurists treated estates primarily as units of production does not make much difference, since one would have expected some statement concerning long-term stores of

68 Kehoe (1997) 9ff. Buck (1983) 7ff notes that the *Corpus iuris civilis* deals with agricultural reality, but that there are biases in its depiction of reality, such as an emphasis on the kind of farming of the well-to-do and a de-emphasis on local variations.

69 *Digest* 33.7.12. See Kehoe (1997) 113ff on *fundus cum instrumento*.

70 *Digest* 33.7.18.9.

71 Cf. *Digest* 33.7.6.

grain for the market if these normally could have been found on an estate. The fact that Ulpian and the other jurists limit their discussion of stocks of corn to seed-corn and food reserves indicates that market-related long-term storage was not considered an important aspect of the functioning of estates.

Secondly, the agricultural writers' remarks on the use of lesser cereals as animal fodder confirm this point. Columella's advice on the feeding of chickens illustrates their attitude: one should feed them barley and other lesser cereals, but only when low corn prices (*vilitas annonae*) allow. If corn is too expensive, one should feed them the leavings of the processing of wheat.⁷² Columella provides similar advice regarding other farm animals: if prices are low, feed barley and legumes to lambs or pigs.⁷³ Undoubtedly, Columella's farmers fed their animals from their own produce. Therefore, the prices referred to are prices they could have obtained, not prices they had to pay. Thus, they were advised to use corn as animal fodder only when the market prices of food were low. The effort and costs involved in keeping chickens, Columella wrote, was only worthwhile near the city, where they fetched a good price.⁷⁴ Hence, the above passage does not indicate capital-intensive poultry farms, feeding grains except when the market price was too high, but should be interpreted as a means of employing lesser grains when general prices were low. The price of lesser grains and legumes was diminished by a good wheat harvest as well. When the price of wheat was low, lesser foodstuffs experienced a decline in demand, leading to low prices. Succinctly put: if the price is low, just feed it to the chickens or pigs! Interestingly, the advice is not to store until prices recover.

Harvest failure and the profitability of cereal farming

Even more illuminating is the Roman landowners' general assessment of the profitability of cereal farming. The ancient landowners realised that abundant harvests did not provide the way to large profits, but that failed harvests did. In an oration dated to 70 BC, Cicero summarised the attitudes of landowners in the Roman world quite plainly:

The reasons for being a farmer at all are the possibility of success and the pleasantness of the life rather than the profits actually earned. Year by year so much labour and so much money are definitely expended for an indefinite and

72 Columella 8.4.1.

73 *Ibid.* 7.3.19; 7.9.9.

74 *Ibid.* 8.4.6.

variable result. Further, the market price is never high unless the harvest is a failure. When an abundant crop has been gathered in, a low selling price is the consequence. So you find that in a good year you have to sell cheap, and if you can sell for a good price you have had a bad harvest.⁷⁵

However, Cicero has earned himself a bad reputation as a source for economic history. His statements on agriculture and economy are often rejected as expressions of his extremely conservative and moralistic views, bearing no resemblance to reality. Admittedly, taking at face value his well-known condemnation of trade and commerce as not befitting a real Roman gentleman, one ends up with a distorted picture of reality. His first words in the above passage seem to confirm these suspicions: one is a farmer because arable farming is a safe and honourable way of life, not because profits are high. However, to completely abandon Cicero as a source on economic history is too simple and would mean that we would lose a valuable source. Cicero was not just the eloquent voice of aristocratic snobbishness. He was also a perceptive and intelligent wealthy landowner. Sometimes, Cicero is not prescribing, but describing. Moreover, in the above passage he is addressing a public that largely consisted of well-to-do Romans, whose wealth largely consisted of land. Thus, moralistic but patently untrue exaggerations would not serve his purpose of trying to convince his audience of the rightness of his argument. One may also wonder whether the financial gains of harvest failure may count as aristocratic morality. Thus, in this case, we should take Cicero at face value. Farmers are at the mercy of the weather, he says. Abundant harvests mean that their crops are worthless; it is only when harvests fail that they may obtain a good price.

In later centuries, members of the Roman nobility would make similar observations. In one of his letters, Pliny complained to a friend that good harvests resulted in bad prices. Pliny too sometimes wrote with disdain about the commercial aspects of his rural possessions. In one instance, he called his estate in Laurentum his most profitable, because it offered him the leisure to pursue his literary activities.⁷⁶ Nevertheless, he offers unique insight into the commercial functioning of a large landowner's estates. Ambrose, bishop of Milan in the late fourth century AD, would almost repeat Cicero's remark *verbatim*: it is only during shortages that good profit is to be made in arable farming.⁷⁷ The implication is the same, when Libanius informs us that the councillors of Antioch reputedly

⁷⁵ Cicero, 2 *Verr.* 3.227.

⁷⁶ Pliny, *Ep.* 4.6.2.

⁷⁷ Pliny, *Ep.* 4.6.1; Ambrose, *Off.* 41. Cf. Appian, *Bell. pun.* 87; Pliny, *Ep.* 2.4.3.

celebrated shortages, while mourning in times of abundance.⁷⁸ Similar, though less negative, is a remark made by Seneca: 'A benefaction is the gift of an estate whose fertility can lower the grain price.'⁷⁹ This price development has, of course, to be explained by the inelasticity of demand: good harvests oversupplied the market, leading to a slump in prices, while prices rose when bad harvests reduced market supply. Cicero, Seneca, Pliny, Libanius and Ambrose therefore did not say anything remarkable. The important point, however, is that storage and carry-over do not play a role in their marketing considerations. Cicero does not say to his audience: when prices are low, farmers wait and make a good profit next year. The Roman landowners' emphasis on the instability of prices confirms the low degree of market integration across time.

Harvest shocks and inelasticity of demand worked to the advantage of the well-to-do farmers, but not of their poorer neighbours. Peasants and marginal farmers only had abundant harvests to sell when the crop was worth relatively little. However, in contrast to their wealthy neighbours, failed harvests offered no compensation, because at such times, they had no crop to sell. Harvest failure turned them into consumers, not sellers of corn, having to pay the high prices that men like Cicero and Pliny profited from. Hence, De Neeve's argument that harvest failure generally was a bad thing for commercial farmers, but not to peasants, is surely wrong.⁸⁰ Large landowners had grain to sell even if harvests failed, deriving from their own crops and from payments of rent-in-kind. The price increase made up for the diminished volume.⁸¹ The seventeenth- and eighteenth-century economists Gregory King and Charles Davenant already argued that in a closed market the inelasticity of demand caused prices to rise more than harvests declined. Among early economists, it was long debated whether in the long run the high degree of price instability proved advantageous or detrimental to the profitability of cereal farming. Nowadays, it is agreed that price stability brings more advantages than instability. K.G. Persson recently stated that price instability reduced long-term profitability, because high profits in bad harvest years did not compensate for the fact that good harvests could not be sold for good prices. During the eighteenth and nineteenth centuries, improvement of market integration across time and space lessened price

⁷⁸ Libanius, *Or.* 16.25.

⁷⁹ Seneca, *Ben.* 3.8.3.

⁸⁰ De Neeve (1990) 388.

⁸¹ Wrigley (1989) 241f. See for 18th-century France, Hufton (1985) 112. Sallares (1991) 395 argues that the price increase during shortages did not compensate for the reduction in bulk, except for very large landowners. Cf. Persson (1999) 25.

instability, thus offering the opportunity to exploit the advantages of good harvests.⁸²

In sum, three conclusions may be drawn: first, a high degree of price volatility resulted in high profits in bad harvest years, but it diminished the profitability of cereal farming in the long run. Secondly, peasants did not profit much from good harvests and suffered hardship in bad harvest years. Thirdly, the purchasing power of the consumers in city and countryside diminished during shortages, while that of the landed elite increased.

The risks involved in viticulture

However, if this is true, how to explain the regularly occurring complaint by Roman landowners of harvest failures? In his letters, for instance, Pliny the Younger regularly mentions that bad harvests had resulted in a loss of income. In AD 98/9, he requested permission from Trajan to visit his estates. His tenants, who, as we have seen, were well-to-do farmers, were financially ruined by a run of bad harvests, leading to the decision a few years later to introduce sharecropping. This seems to contradict his own words, lamenting the low prices following a good harvest:

A storm of hail, I am informed, has destroyed all the produce of my estate in Tuscany, while that which I have on the other side of the Po, though it has proved extremely fruitful this season, yet from the excessive cheapness of everything, turns to small account.⁸³

While Pliny's letters concerning his possessions near Comum offer no indication of any particular specialisation, his estates in Tuscany, including the farms of his tenants, undoubtedly specialised in the market-oriented cultivation of vines. The seeming contradiction is surely to be explained by the differences between grain crops on the one hand and cash crops like grapes or olives on the other.

The difference regarding demand elasticity between grains and crops like wine and olives resulted in opposite effects on the profitability of bad harvests. The demand for olive oil and wine was far more price elastic than for grains, because these foodstuffs – although important suppliers of calories – were less crucial for survival. Hence, harvest shocks of wine or olives resulted in less extreme price movements. Furthermore, wine and

82 Persson (1999) 31. On Davenant and King, Wrigley (1989) 235f; Persson (1996) 692ff; Nielsen (1997) 5ff; the latter's corrections rejected by Persson (1999) 48ff, 55ff.

83 Pliny, *Ep.* 4.6.1.

olive oil were easy to store and were not (or, at least, less) subjected to an annual fluctuation of their market prices.⁸⁴ Good-quality wine increased in price when stored for a long period. See, for instance, the following comment in Varro's *de re rustica* on the large storage capacity on a vineyard as advised by Cato:

... I imagine he fixed the number of *cullei* so high in order that the farmer might not be forced to sell his wine every year. For old wine brings a better price than new, and the same wine a better price at one time than at another.⁸⁵

However, long-term storage should not be overestimated. Pliny the Elder declares often to have observed that, owing to insufficient storage capacity, farmers poured away older stocks to fill their containers with new wine.⁸⁶ The marketing of olive oil was dependent by nature on storage, because olive trees only offer a good harvest every other year. The regularity of harvest shocks in the cultivation of olives by itself required a large degree of marketing across time.

Hence, both a larger degree of price elasticity and a larger extent of carry-over of wine and olive oil diminished price instability in comparison to grain. Moreover, large-scale market-orientated cultivation of vines and olives did not operate within the context of a closed market. Wine and olives were attractive crops only when sufficiently stable markets were present. These were often external markets. W. Jongman pointed out that high transport costs soon exhausted any profitability of vine cultivation in isolated, inland regions.⁸⁷ Pliny's vineyards, located as they were on the Tiber, found a profitable market in the city of Rome.⁸⁸ M.S. Spurr concluded that, in comparison to grain, 'the market for wine and oil in any one town was much more limited. Thus Italian wine producers relied on a multiplicity of markets within, but also without Italy, as finds of amphorae from the Ager Cosanus so well demonstrate.'⁸⁹ Famous

84 In contrast, Rathbone (1997) 202ff concludes that, in contrast to wheat, the price of wine 'had a much greater tendency to seasonal fluctuation' (p. 204). The greater price elasticity of wine would make that an unlikely situation, while Rathbone offers no evidence to substantiate his claim.

85 Varro 1.22.4. Cf. Cato's advice regarding storage: 'It is well for the master to have a well-built barn and storage room and plenty of vats for oil and wine, so that he may hold his products for good prices. It will redound to his wealth, his self-respect, and his reputation' (*de agri cult.* 3.2). See also Columella 1.6.9.

86 Pliny, *Hist. nat.* 18.319.

87 Jongman (1988) 137ff. See also Braudel (1990) 321ff, who points out that only wine of high quality could afford to travel.

88 Pliny, *Ep.* 5.6.12. On the importance of Rome as market for Italian wines, see Morley (1996) 112ff.

89 Spurr (1986) 144.

wine-producing regions, such as the *ager Campanus* and the *ager Cosanus*, exported to overseas markets.⁹⁰ Even when overseas markets declined, a substantial market for cheap wines was left in the city of Rome.⁹¹ Because of the importance of inter-regional trade, the harvest shocks in one particular supply region had less overall impact on the market.

Hence, a local good harvest did not cause a slump in prices on an oversupplied market, thus offering the opportunity to sell a bumper harvest at a good price. Conversely, a bad vine harvest did not cause prices to multiply and thus failed to compensate for the decline in bulk.⁹² A bad harvest simply meant less crop to sell. Interestingly, a letter from Egypt, dating to the early second century AD, points to the opposite situation. In this letter, a landowner remarks that, if there was an abundant vintage for a number of years, the price of the crop would fall.⁹³ The fall of prices as supply increased implies that, in contrast to the better wines of Italy, the Egyptian wines that are referred to in this papyrus must have been marketed locally. Bad wine can be sold profitably, Columella says, if you produce enough of it.⁹⁴

In sum, the main differences between grain and cash crops like olives and grapes consisted of less instability of market prices and the fact that profit was more or less proportionate to the size of the harvest. Even if exports were insufficient to absorb an extremely good vintage, the subsequent reduction in prices was not sufficient to undo the rise in bulk. Contrary to grain, cash crops like olives and grapes allowed selling good harvests at good – or, at least, reasonable – prices. If you had access to a good market, wine and olive oil offered more income than grain. However, in contrast to grain, harvest failure meant loss of income, since the loss of bulk was insufficiently compensated – if at all – by an increase of prices.

Nicholas Purcell has argued instead that viticulture was a risky form of agriculture because the prices were extremely volatile, leading to losses at a time when prices were low.⁹⁵ He offers a passage from the elder Pliny in support: ‘in periods of falling prices outgoings exceed takings.’⁹⁶ Purcell

90 *Ager Campanus*: Arthur (1991b) 74. *Ager Cosanus*: D’Arms (1981) 55ff. See also Dyson (1992) 34f.

91 Purcell (1985) 9ff; Whittaker (1985) 50ff; Pleket (1990) 85, 99f.

92 Kehoe (1989) 580 writes that Pliny’s tenants ‘as small-scale farmers selling relatively small amounts of crops, would in all likelihood not be compensated by the higher prices accompanying a poor harvest.’ If he implies that large-scale producers were compensated by higher prices, he is wrong.

93 P.Giss. 79. Quoted by Rathbone (1997) 201.

94 Columella 3.2.5. Cf. Morley (1996) 118.

95 Purcell (1985) 2ff.

96 Pliny, *Hist. nat.* 17.213.

argues that 'the prices of wine were always prone to extreme fluctuation because of the vagaries of the season. Glut years and ruined vintages are both only too common. Price changes might have been survived but for the problems of labour in the vineyard.'⁹⁷ In other words, the large capital investment that was due to the high input of labour in viticulture required large returns. According to Purcell, bad harvests resulted in ruin, because of the price change they resulted in. However, this is contrary to the theory of price development. If anything, prices should have risen when harvests failed; they certainly would not drop after a bad grape harvest. However, because of the reasons discussed above, the price of wine did not rise sufficiently – the more integrated the market, the less prices rose – to compensate for the loss in bulk. Hence, it was not the price changes that made viticulture a risky business, but the fluctuation in bulk. This was the more so, as Purcell rightly pointed out, because of the capital-intensive nature of the crop.

Investment in cereal farming

The recurring experience of landowners – good cereal crops had to be sold at low prices – resulted in a negative attitude towards investment in arable farming. Such an attitude lay at the heart of agriculture in early modern Europe: 'The very characteristics of *ancien régime* agriculture . . . lend support to the idea that short-run adaptations prevailed. And for good reason: facing great uncertainty as to future prices, risk-averse producers would not dare to invest in land improvements and new equipment.'⁹⁸ Of course, the argument is true that the landowner who had the largest crop when harvests failed, profited most from the inflated prices. However, that was not much of an incentive, because the return of this investment was very insecure indeed. Cato the Elder declared that Jupiter threatened profits in arable farming, while Cicero, as we have already noted, lamented that a farmer was always at the mercy of the weather.⁹⁹ Instead, bad harvests seemed almost effortlessly to cause a windfall. Thus, the impression may have prevailed that, above a certain level of competence, profitability of cereal farming was largely a matter of luck, offering little reward to large investments.¹⁰⁰

97 Purcell (1985) 3.

98 Persson (1999) 20. Likewise Chartres (1985) 459 regarding England: 'Short-run price movements were the primary influences upon producers' and merchants' decisions.' Also Phillips (1979) 48. Cf. Morley (1996) 72 regarding the Roman world.

99 Plutarch, *Cato maior* 21.5; Cicero, 2 *Verr.* 3.227.

100 Cf. Halstead (1987) 86.

This is not to deny the importance of grain cultivation on the estates of commercial landowners.¹⁰¹ However, it does clarify the choices made by farmers regarding the cultivation and marketing of grain. In terms of profitability, Cato assigned grain land the sixth place, after vineyards ('if it produces bountifully wine of a good quality'), gardens, osier-beds, olive-groves and meadows, and before a wood lot, an orchard and a mast grove.¹⁰² M.I. Finley rightly pointed out that Cato's rule-of-thumb ignored such variables as location with respect to marketing opportunities or soil conditions.¹⁰³ However, the commonsensical nature of the passage actually increases the credibility of Cato's low opinion of cereal cultivation. Varro mentions that some people disagreed with Cato's listing, but it was meadows that were alternatively assigned first place.¹⁰⁴ Of course, such statements should be treated cautiously. Columella – a zealous advocate of the cultivation of vines – seems to be guilty of distorting the productivity of cereal farming in favour of vineyards.¹⁰⁵ Nevertheless, the authors of agricultural manuals agree that, while farmers should cultivate sufficient grain to cover their needs, it was not the high returns on investment that made it an attractive crop.¹⁰⁶

A farmer like Cato regarded grain as an important crop to fulfil the needs of one's own farm. His agricultural manual contained lists of the required inventory of a vineyard and an olive-grove, but no such advice regarding farms specialised in grain crops. Surely, the estates that contained olive-groves and vineyards also produced grain. The following passage clarifies Cato's position regarding storing and selling the produce of his farms: 'Sell your oil, if the price is satisfactory, and sell the surplus of your wine and grain.'¹⁰⁷ The grain produced on farms specialising in olives or vines was primarily meant for the farm's own needs, not to sell on the market, except for the occasional and inevitable surplus.¹⁰⁸

101 The importance of grain cultivation in the villa economy is well argued by Scheidel (1994a) 159–66.

102 Cato, *de agri cult.* 1.7. Cf. Cicero, *Off.* 2.89.

103 Finley (1985) III.

104 Varro 1.7.9. Cf. Reekmans (1986) 267.

105 Columella 3.3.3. Duncan-Jones (1982) 39ff, esp. 55; Kehoe (1988) 25f; Pleket (1990) 96ff.

106 Thus Duncan-Jones (1982) 34ff; Jongman (1988) 140. Cf. Kehoe (1997) 107. Safrai (1994) 126f argues that grapes were the most profitable crop in Roman Palestine and that wheat was less profitable than grapes or olives. Liebeschuetz (1972) 72 n. 3 points out that in Syria, for purposes of taxation, 'a little over one *iugerum* of mature olive trees was held equivalent to 5 *iugera* of vineyard or 20 *iugera* of arable'.

107 Cato, *de agri cult.* 2.6. Cf. *ibid.* 10; II.

108 Cf. Scheidel (1994a) 162: 'There is no clear indication that Cato envisaged growing grain for the sake of selling it.'

Similarly, the occasional remarks on legumes in his work imply that Cato regarded legumes as an important crop. Nowhere, however, are legumes mentioned as a marketable crop.¹⁰⁹ Cereals and legumes were mainly grown to fulfil the estate's needs. A prudent farmer tended to produce more grain than he needed, because it was a costly matter to buy when the harvest fell short of expectations. Overstating it a little bit, a farmer like Cato was a market supplier of corn almost inadvertently, if only because of the requirements of his rural and urban workforce.

This is not to say that large landowners only grew grain for their subsistence needs. Even if grain cultivation did not offer high profits – except when harvests failed – to landowners who had much capital to invest in agriculture, it was still a good market crop to grow. Apart from their own requirements, three reasons may be given why many wealthy farmers cultivated and sold grain on a large scale. First, many regions did not meet the physical conditions that were required for heavy investments in the market-oriented cultivation of vines and olives. Secondly, in terms of bulk and value, grain undoubtedly was the largest single item of trade in the Roman economy. The majority of the population of the Roman world was more or less self-sufficient, but the urban population had little resort to food outside the market or upper-class support. Thus, the ubiquitous nature of the demand meant that there was a market for cereals almost everywhere. The peasantry had a relatively small share in the supply of this market. In the case of wine, for instance, one needed to be close to a sizeable market, or to waterways that offered access to outside markets. W. Jongman pointed out that the cost of transport of wine over land is higher than that of grain. 'One hectare of a vineyard implies four times more transport costs than a hectare planted with cereals. Therefore wine, starting from a higher level of profitability at the market than grain, falls off far more rapidly than grain.'¹¹⁰ In other words, if the distance to markets increases, the profitability of vines decreases. Thirdly, the practice of wheat, barley or bean cultivation in the Roman world did not necessitate huge capital investments. The ceiling of sensible capital investment in the cultivation of basic foodstuffs was soon reached.¹¹¹ In other words,

109 Thus, Flint-Hamilton (1999) 373.

110 Jongman (1988) 141. Jongman (2003) 114 estimates that 2% of the cultivable land of Italy was sufficient to cover the requirement of oil and wine of the entire urban population of Italy. Hence, even when including exports, the market for wine and olive oil was soon saturated.

111 Wallace-Hadrill (1997) 191: 'Few were willing to tie up their precious cash in projects which in the long term might increase significantly the level of return from their estates.' Cf. Garnsey and Saller (1987) 73ff; Kehoe (1992) esp. 2 and 168ff; Pleket (1993a) 15; Purcell (1995), 173; Paterson (1998) 158f.

grain cultivation offered a return even without the investment of much capital.

Hence, from the viewpoint of the Roman landowners, there was no need to invest much capital in arable farming. An alternative approach – maximisation of the exploitation of those working the land – was more attractive.¹¹² Moreover, wealthy landowners who had money to spare rather bought additional land or they invested it in the other sectors of the villa economy: primarily olive oil and wine, but also poultry and fish, and factories for pottery, brick or tiles. The Roman upper class was not averse to profit and participated in the huge market that existed in the city of Rome for products that ranged from cheap wine to dormice.¹¹³ In addition, landowners invested their wealth in urban manufacture, building, transportation or services. Purcell rightly points out that the Roman elite were very much interested in – even proud of – the productiveness of their estates. They were not even averse to risky investments on their villas.¹¹⁴ However, this should be put in context. Upper-class Romans could afford some risky investments precisely because the main parts of their estates offered a moderate, but stable income. As we have seen, cereal farming offered a certain income in bad years as well as in good years. The profitability of wine was less stable, but losses were reduced by marketing strategies that reduced risk and thus stabilised income in most years at the cost of reduced profits in some years. Hence, the acceptance of risk in some enterprises does not contradict the landowners' general aversion to high capital investment in risky, though potentially profitable enterprises. Earnings were adequate without large investments, which left much scope for other considerations than profit maximisation to determine the landowners' economic behaviour. A large share of their income was not invested at all, but spent on such non-productive necessities as were expected of Romans of high social standing.¹¹⁵

This may lead to the question whether ancient landowners behaved economically 'rationally'. I cannot speak for every individual, but I do not doubt that in general they did. However, that does not mean that profit

112 Jongman (1988) 54. Cf. Finley (1985) 144: 'The prevailing mentality was acquisitive, but not productive.' Also Seavoy (1986) 17 argues that in peasant societies the values of landlords are not commercial, but acquisitive. Their main aim is not to maximise production, but their share of the surplus produced by those working the land.

113 Purcell (1995) 151ff emphasises the productiveness of the upper-class possessions near Rome.

114 *Ibid.* 156f, contra his own emphasis on risk-aversion in his article from 1985.

115 On investment, see Kehoe (1989) 556f; (1997); Mratschek-Halfmann (1993). On the 'rationality' of ancient landowners, De Neeve (1985) 92ff; Pleket (1993b) 340f; Morley (1996) 73ff; Wilson (2002) 5f. Cf. Martin (1967) 229ff.

maximisation should have been their one and only goal.¹¹⁶ It has been claimed that the accounting systems used on Appianus' estates in Egypt showed the 'rationality' of management. However, it was difficult – if not impossible – for ancient landowners to analyse the long-term and short-term profitability of their investments. Accounting systems gave a detailed picture of what was, but were a clumsy instrument to calculate what could have been. J.K. Davies rightly pointed out that such systems 'were designed to prevent embezzlement rather than to quantify each input into each activity and thereby to reveal net profit or loss'.¹¹⁷ The limitations of their management tools do not point to the 'primitivism' or 'irrationality' of their mentality, but rather to the limitedness of their management goals. Most ancient landowners had little reason to complain of things as they were – that is, beyond such occasional grumbles about the weather and the tenants as befitted an aristocratic landowner.

In sum: large investments in other sectors of the villa economy did not preclude extensive involvement in the grain market. Grain held little risk, because it required little cash, while there was always a market, even if sometimes at low prices. Well-to-do farmers were able to wait until the prices rose at the end of the growth cycle, and thus in most years could obtain at least reasonable prices. Because of the inelasticity of demand, good harvests created oversupplied markets, and thus low prices. Conversely, harvest failure offered good prices, which made up for the decline in bulk. However, marketing between harvest cycles or across space played little role in the cereal farmers' considerations. Since price developments were unpredictable, cereal farmers' decisions were short-term. Long-term storage was insufficient to reduce price volatility. The annual price cycle constituted the main incentive to store grain and exploit price differences in time, but the market offered insufficient incentive to overcome the risks and obstacles involved in long-term storage. Vines and olives, on the other hand, were characterised by a higher degree of market integration, offering the opportunity to sell good harvests at good prices, and thus offering better conditions for long-term strategies of carry-over and inter-regional trade.

116 Thus also Foxhall (1990) 100. Cf. Hitchner (1993) 502ff, who argues that maximisation of olive oil production shows the rationality of the investors' economic behaviour.

117 Davies (1984) 272. Bagnall (1997) 25ff shows that the purpose of the Kellis account book (4th century) was limited. It contained very limited information on the rent payments of the tenants on that part of the estate for which the writer was responsible. Most importantly, Bagnall observes that 'not only are these accounts not elements of a systematic accounting system, they are not the raw materials for the creation of one' (p. 29). Cf. Jongman (2000b) 264.

MARKETING ACROSS SPACE

Connectivity and isolation

Production of food and its consumption are not evenly spread across space; supply and demand create flows of grain between one area and another. It is beyond doubt that trade in the Roman world responded to regional differences in production and consumption. The sustenance of the capital city of Rome and the Roman armies required the intervention of the state on the basis of coercive, non-market channels, but the overall scale of urbanisation in the Roman world is an indication of the capacity of the grain trade at the time.¹¹⁸ The question is whether the food producers in antiquity not only served a few markets on a large scale, but were also equally successful in compensating for inter-annual differences in production. The strength of the food market – in the ancient world as much as in later times – was determined by the degree to which the market was capable of compensating for local harvest shocks.

Eighteenth-century economists were convinced that harvest shocks caused heavy fluctuations in production locally, but that production in Europe on aggregate was very stable. Climate, soil conditions and crops all differed in the various regions of Europe. Hence, local harvest shocks would be cancelled out. Of great importance to the liberal economists of those days was the idea that if one nation experienced shortage, another was sure to experience glut. Hence, it was due to the inadequacy of trade that shortages were allowed to exist. The workings of the market were hampered by the short-sighted nationalist policies of individual countries. In particular in France, voices were increasingly heard that expressed the need for the establishment of free trade; these ideas were later incorporated in Adam Smith's *The wealth of nations*. Such liberal ideas were truly revolutionary, because merchants and businessmen were conventionally seen as manipulating profiteers of the consumers' needs.¹¹⁹

Many modern historians of the ancient world are arguing along the same lines as the eighteenth-century economists (which in itself should serve as a caution). These historians point out that two features of the ancient Mediterranean world were ideally suited to strengthen the grain trade in cancelling out harvest shocks. First, the very fragmented nature of the Mediterranean world alleviated the impact of harvest shocks. In the

118 On taxation and the food supply of Rome, see [next chapter](#).

119 Hufton (1985) 120f; Schmidt (1991) 276ff; Simpson (1995) 85f; Persson (1999) 7ff, 131ff.

words of Horden and Purcell, the Mediterranean was (and still is) a region that is defined by its numerous microregions. Thus, if one microregion is experiencing shortage, another is sure to experience abundance. Because microregions are small by definition and there was a Mediterranean Sea to connect them all, the Mediterranean world was in a better position to deal with the effects of harvest shocks than the vast stretches of land of early modern Europe. Secondly, they point out that the small-scale nature of much of the Mediterranean trade was ideally suited to fulfil this need: shippers traversed the seas in small vessels, responding to rumours and short-term price differences, picking up a cargo in one harbour and selling it in another. 'Commerce of this kind has an accidental, casual flavour about it; destinations, cargoes, the speed of the voyage, what was available and what was wanted in each locality all change, season to season.'¹²⁰ Thus, almost by accident, the shippers and traders involved in this so-called *cabotage* (coasting trade or tramping) facilitated the integration of the markets of the Mediterranean microregions.

Both the relative ease of overseas shipment in the Mediterranean world of antiquity and the activities of numerous small-scale traders are beyond doubt. However, by themselves, these factors tend to exaggerate the extent of market integration in the Roman world. While some regions were undoubtedly served by traders, who distributed local surpluses over a wider area, other regions were not. Witness to this latter fact are the famous words of Gregory of Nazianzus, expressed on the occasion of a famine in Cappadocian Caesarea:

There was a food crisis, the most terrible in the memory of man. The city languished but there was no help from any part, no remedy for the calamity. Cities on the seacoast easily endure a shortage of this kind, importing by sea the things of which they are short. But we who live far from the sea profit nothing from our surplus, nor can we produce what we are short of, since we are able neither to export what we have nor import what we lack.¹²¹

Two conflicting principles operated in the Roman world: connectivity and isolation. Market integration of grain is a measure of the degree to which the grain trade was able to overcome isolation and achieve connectivity. An analysis of the extent of market integration requires that the

¹²⁰ Horden and Purcell (2000) 142. Cf. Braudel (1966) 107f; McCormick (2001) 422.

¹²¹ Gregory Naz., *In laudem Basilii* 34f. Quoted from Garnsey (1988) 22. Likewise Davies (1984) 271: '... in areas not accessible by ship ... we must therefore envisage an underlying pattern, distinguished by local famines and local gluts, of production for local consumption without recourse to trading or to a 'market'.

elements of 'easy' shipments across the Mediterranean and of coasting trade be investigated in the wider context. This section will discuss first the 'physical' and technical capabilities of transportation across land and sea; secondly, communication and the 'time-stress' in the response of transportation and trade to supply and demand; and thirdly, the relationship between transportation costs, isolation and price differences.

Ancient 'cabotage': vessels, harbours and small-town markets

Almost by its nature, tramping was unlikely to attract the attention of literary authors or Roman jurists. In some respects, however, enterprises that were on a larger scale than coasting trade reveal something of the workings of overseas commerce in the Roman period. Trimalchio, for instance, bought five ships, loaded them with wine, and sailed to Rome, because at the time this commodity fetched a good price there. After his first venture had turned out disastrously and his ships were all wrecked, he loaded a more diverse cargo, consisting of wine, bacon, beans, perfume and slaves.¹²² Not all such enterprises turned out profitably. According to Cicero, the Roman knight Rabirius made little money when his ships, coming from Egypt, finally arrived in Puteoli, despite rumours to the contrary: '... a deceptive appearance, because the goods coming in were only paper, linen and glass. Many ships were packed with these, and so the proceeds did not even compensate for transportation costs.'¹²³ Although Cicero may be exaggerating, as he was defending Rabirius against a claim that he had made illegal profits in Egypt, his story must at least have been plausible. Hence, this case may serve as a warning that lack of communication in antiquity (as well as in later eras) made long-distance trade a bit of a gamble. The risks of overseas trade, but also the large profits that could be obtained, were proverbial.¹²⁴ Although, according to upper-class mentality, agriculture was to be preferred to overseas trade, the latter depended on investment from imperial and urban elites.

The importance of *cabotage* (or tramping) in Mediterranean trade was due both to the nature of the market and to the natural conditions of Mediterranean shipping. Populous and wealthy cities were able to support the large-scale trade and specialised merchants of 'high commerce', but small towns were much better served by the 'low commerce' of tramping.

122 Petronius, *Sat.* 76.6.

123 Cicero, *pro Rabirio* 40.

124 Petronius, *Sat.* 83.10.

Many more towns needed small amounts of many different goods than there were cities that required goods in large amounts. Moreover, large ships were unable to enter either the mostly shallow harbours of small coastal towns or to navigate rivers that provided access to inland river ports.

Ships were employed for various purposes and in various circumstances. Hence, many types of ships of various sizes provided overseas transportation in Roman times.¹²⁵ The biggest ships from mid-Republican times onwards reached a size of up to 1,000 metric tonnes burden. In Imperial Rome, the corn supply of the city of Rome regularly employed ships of about 350 tonnes burden, although many were undoubtedly much smaller. The emperor Claudius granted certain privileges to anyone who put a ship of 10,000 *modii* (70 tonnes) for at least six years into the service of the capital city's grain supply. Later more privileges were added for those owners who employed one ship of 50,000 *modii* or five ships of 10,000 *modii* in the grain supply of Rome.¹²⁶ These measures were intended to stimulate the number of vessels involved in the grain supply of the city. Hence, it is likely that the required tonnage of 70 tonnes was below average, since the measure would otherwise only have served to discourage the owners of smaller vessels.¹²⁷ Nevertheless, it also indicates that such small vessels contributed significantly to shipments of grain. The enormous market of the city of Rome with its constant demand, however, stimulated the use of ships larger than the average type. In addition, the limited sailing season for ships coming for instance from Alexandria made it worthwhile to use vessels big enough to manage large amounts in the few trips possible during each season.

Freighters in operation during Roman times usually had a capacity of at least 70 tonnes, but outside the context of the grain supply of Rome, ships of 200 tonnes or more will have been uncommon. Large ships were rare because they were too large to be handled in small ports. George Houston argues that most ships in Roman times were 60 tons or less and thus had no need of elaborate port facilities, but could be beached

125 On the tonnage of ancient ships, Casson (1971) 171f; Rougé (1981) 75ff; Hopkins (1983) 97ff; Meijer (1986) 169f; Houston (1988) 553ff; Herz (1988) 62ff; Galsterer (1990) 26f; Rickman (1991) 103ff; Gibbins (2001) 285f; McCormick (2001) 95f. Regarding later times, see Braudel (1966) 296ff.

126 Gaius, *Inst.* 32c; Suetonius, *Claud.* 19. Cf. Herz (1988) 90ff, 122f; Sirks (1991a) 61ff. One may add that in AD 439 in the East a minimum capacity of 2000 *modii* was laid down, which reflects the change of circumstances from the early Principate. See Tengström (1974) 37.

127 In contrast, Houston (1988) 558 states: 'The decree clearly implies that, in Claudius's day, there were many ships in the grain fleet which were *not* as large as 70 tons.'

and (un)loaded almost anywhere.¹²⁸ During the early Middle Ages as well, ships landed almost anywhere on the coasts of the Mediterranean Sea, but this practice was necessarily confined to small vessels.¹²⁹ In contrast, we are told in Petronius' novel that a shipper could not steer his ship into any harbour he passed by, because a ship like his could only enter spacious harbours.¹³⁰ Although Houston's case seems to be somewhat overstated, he does show that small vessels operating on the short range did not require large harbours and were thus capable of serving small coastal markets.

Sizeable freighters that were used to cross the open sea were all sailing ships; they had no recourse to oars. On coastal routes smaller types of freighters were used, some of which were galleys, i.e. were operated largely or at least partly by oars. Unlike the smaller, coastal freighters, which had recourse to oars in addition to sails, the larger vessels were at the mercy of the wind.¹³¹ Ancient sailing ships could not sail very close to the wind. Some conditions, especially on voyages in a north-south direction, which could profit from the generally northerly winds, provided a quick voyage and allowed, for instance, a ship to sail from Sicily to Africa in three days or from Crete to Alexandria in three or four. On other voyages ships had to beat up against adverse winds and could be delayed by days, even weeks.¹³²

Moreover, sea-going ships that had no oars could not travel up navigable rivers that connected some inland cities (like Rome itself) to the sea. To a citizen of northern or central Europe, most rivers of the Mediterranean lands are not very impressive, but to an ancient Greek like Dionysius of Halicarnassus, Italy had many good rivers that facilitated trade and made transport cheap.¹³³ Of course, much transportation on navigable rivers was downstream and many rivers were navigable only for a relatively short stretch from the sea. Nevertheless, some overseas transportation went inland along rivers, as is for instance attested in the following case in the *Digest*:

128 Houston (1988) 560ff. Unfortunately, he makes little use of Mediterranean parallels.

129 McCormick (2001) 418ff.

130 Petronius, *Sat.* 101.9.

131 Höckmann (1985) 57, points out that the need for a crew of rowers would constitute a disadvantage for freighters otherwise not requiring a large crew. Also rowing banks would diminish the ship's loading space. See also Casson (1971) 157ff, 272ff; Rougé (1981) 21f; McCormick (2001) 407f.

132 On the speed and duration of overseas voyages, see Kolb (2000) 318f; McCormick (2001) 481ff.

133 Dionysius 1.37.5.

If a shipowner contracts to convey freight to Minturnae and then transfers the goods onto another ship because his own ship cannot get up Minturnae's river and the second ship then founders at the river's mouth, is the first shipowner liable? Labeo says he is not liable if he is free from fault. But if he acted against the owner's will or at an improper time or [transferred goods] to a less suitable ship, then there should be an action on lease of a job.¹³⁴

Although the text actually refers to a case in which the load was transferred to another vessel at the mouth of the river, the comment shows that this could have been done against the will of the owner, who in that case must have expected that the ship he had hired would take its load upriver. Hence, small ships offered more flexibility than large ships, because they could enter shallow harbours and traverse upstream on navigable rivers.

Regional trade in a variety of merchandise required the flexibility that only small vessels offered. This was not only a question of selling one's wares, but also of buying various goods along the way. Coastal traders probably preferred to buy their foodstuffs and products as close as possible to the farmers and manufacturers, because intermediary middlemen and merchants only served to drive up prices. This required the ability to enter small ports along the way, not just the large harbours. The markets of various foodstuffs and manufactured goods in such ports were relatively small. The inhabitants of these towns and their hinterland did not need large amounts of silken or linen garments, tools, pottery, kitchen ware, etc., the more so if local demands were partly served by local producers. Even wine, olive oil and grain were often required only in limited volumes. Hence, it is not surprising that in our literary sources ships engaged in overseas trade often carried many diverse goods.¹³⁵ In addition, recent studies of shipwrecks from the Roman period show the highly heterogeneous nature of the cargoes that these ships carried.¹³⁶ In sum, small vessels that carried cargoes consisting of many diverse goods and products were more suitable for supplying the markets of smaller

¹³⁴ Ulpianus *Digest* 19.2.13.1. See also 19.2.1.3.2: 'If a ship's captain sent his ship into a river without a pilot . . .' Cf. Casson (1965) 32.

¹³⁵ For instance, the freighters that had arrived in Sicily from the East and that were confiscated by Verres during his governorship in the 70s BC carried purple from Tyre, incense, perfumes, linen garments, gems and pearls, wine from Greece and slaves from Asia. Cicero, 2 *Verr.* 5.146. Cf. Paterson (2001) 373f. Although this case does not refer to coastal traders, the point that merchants often preferred a mixed cargo remains the same. See also Rathbone (1983) 52; Gibbins (2001) 288ff on Hellenistic trade.

¹³⁶ Harris (2000) 732; Horden and Purcell (2000) 368f. A similar picture arises from Hellenistic wrecks: Gibbins (2001) 293.

towns than the large freighters that served the supply of the Mediterranean metropolises. Only in the latter context may we expect vessels carrying hundreds of tons of grain, or the specialised 'wine freighters' which were, according to the *Digest*, common in the Roman Empire.¹³⁷

In addition, tramping required less capital and was less risky than the trade using large freighters. As an example of the latter, a late-fifth-century BC shipwreck found near the island of Alonnesos in the north-west Aegean may be used. Its cargo consisted of two different kinds of wine and fine pottery. It is a large vessel – according to David Gibbins, the largest Greek wreck known. He observes that 'a ship of this size represents a considerable outlay of labour and resources, and the cargo may thus reflect a highly organized, "destination-conscious" trade.'¹³⁸ 'Destination-conscious' is an excellent characterisation of this kind of trade as opposed to cabotage. However, this was not only due to the greater cost of building and maintaining such ships, but also to the fact that in the larger cargoes of such vessels more capital was bound up for longer periods of time. The shippers of the coasting trade sailed from one harbour to the next, selling part of their cargo and buying new, which meant that less capital was used more frequently. Businessmen who invested large amounts of money for longer periods of time required a good chance of profit as a reward for their efforts. Owing to the shorter time-span and varied nature of the trade, risks were smaller in comparison to the large-scale, long-distance commerce that specialised in one commodity. On average, the rate of profit was probably smaller too.

In short, tramping is characterised by the small scale of the trading, the heterogeneous nature of the commodities and by the varied and unpredictable destinations of the trade. For our purpose, the most interesting issue is the contribution of this trade to the distribution of local surpluses of food.¹³⁹

Markets and rumours: A case-study from the age of Demosthenes

We may use an example from late Classical Greece to illustrate the workings of ancient commerce. This detailed account we owe to a charge against a shipowner called Dionysodorus in an Athenian court of law. The plaintiff's oration is included in the corpus of orations by Demosthenes,

¹³⁷ Ulpianus *Digest* 47.2.21.5.

¹³⁸ Gibbins (2001) 283ff, 290 (quote from p. 286).

¹³⁹ Cf. Forbes and Foxhall (1995) 78: 'On Methana in the past, villagers sold their surplus wheat and olive oil to the captains of small coasting vessels who would visit at irregular intervals.'

but because references to certain events date the oration to the year of Demosthenes' death at the earliest, there is doubt as to its authenticity. It remains an important and reliable source on the workings of trade. The plaintiff starts by saying that he contributed to a loan to Dionysodorus and his partner Parmeniscus:

[These men] came to us last year in the month *Metageitnion* [late August, early September] and said that they desired to borrow money on their ship on the terms that she should sail to Egypt and from Egypt to Rhodes or Athens, and they agreed to pay the interest for the voyage to either one of these ports. We answered, men of the jury, that we would not lend money for a voyage to any other port than Athens, and so they agreed to return here, and with this understanding they borrowed from us three thousand drachmae on the security of their ship for the voyage out and home.

Unfortunately, Dionysodorus and Parmeniscus did not abide by the contract. The reasons for this are described by the plaintiff in detail:

Parmeniscus sailed in charge of the ship; Dionysodorus remained at Athens. All of these men, I would have you know, men of the jury, were underlings and confederates of Cleomenes, the former ruler of Egypt, who from the time he received the government did no small harm to your state, or rather to the rest of the Greeks as well, by buying up grain for resale and fixing its price, and in this he had these men as his confederates. Some of them would despatch the stuff from Egypt; others would sail in charge of the shipments, while still others would remain here in Athens and dispose of the consignments. Then those who remained here would send letters to those abroad advising them of the prevailing prices, so that if grain were dear in your market, they might bring it here, and if the price should fall, they might put in to some other port. This was the chief reason, men of the jury, why the price of grain advanced; it was due to such letters and conspiracies. Well then, when these men despatched their ship from Athens, they left the price of grain here pretty high, and for this reason they submitted to have the clause written in the agreement binding them to sail to Athens and to no other port. Afterwards, however, men of the jury, when the ships from Sicily had arrived, and the prices of grain here were falling, and their ship had reached Egypt, the defendant straightway sent a man to Rhodes to inform his partner Parmeniscus of the state of things here. . . . Parmeniscus, when he had received the letter sent by him and had learned the price of grain prevailing here, discharged his cargo of grain at Rhodes and sold it there.¹⁴⁰

We are told furthermore that Dionysodorus and Parmeniscus were not the owners of the entire cargo of their ship. The other owners, the plaintiff tells us, were forced to hire transportation in other freighters in order to

convey their goods from Rhodes to the Athenian market. Moreover, the accused not only had grain on board, but also other goods, which they did bring to Athens: 'They shipped to you the other goods, from which they hoped to make a profit.'¹⁴¹ However, their ship did not come into Athens, because during the remainder of the year and the next year, it continued to sail between Egypt and Rhodes.

This was more to their advantage than to continue the voyage to this port. For voyaging from Rhodes to Egypt is uninterrupted, and they could put the same money to work two or three times, whereas here they would have had to pass the winter and await the season for sailing.¹⁴²

In its detail, this is a unique source on shippers and traders wandering across the sea in search of good markets to sell their cargo. Although describing late Classical or early Hellenistic conditions in the East, it offers insight into the workings of such trade in general. A few elements in the plaintiffs' account call for some comment.

The fact that Dionysodorus and Parmeniscus offered their ship as collateral for the loan of 3000 *drachmae* shows that they were shipowners. We may distinguish three ways in which they made money: 1. They brought grain from Egypt to Rhodes and sold it there; 2. They transported other goods on the ship, which they transferred to another ship and sold in Athens; 3. They leased part of the transport capacity to other merchants destined for Athens, who had to hire transportation on other vessels when the ship did not go beyond Rhodes. Although grain was the main cargo, it was not the only egg in their basket. According to the plaintiff, his opponents were henchmen of Cleomenes, but there is little to substantiate this claim, which may have been little more than slander.¹⁴³ Dionysodorus and Parmeniscus required a loan of 3000 *drachmae*. One may wonder whether Cleomenes' henchmen would have needed a loan of 3000 *drachmae* for their enterprise and would have accepted the limitations that went with it. According to Athenian law, the loan severely limited their operational flexibility, as they were not allowed to bring grain to any other port than that of Athens. In general, Athenian citizens, or vessels financed by Athenian capital, were restricted in their grain trade to the supply of the Athenian market.¹⁴⁴ Such a clause was accepted, the plaintiff says, because the grain price in Athens was high at the time. Parmeniscus used the borrowed capital illegally after selling grain at

141 *Ibid.* 56.24–5.

142 *Ibid.* 56.30.

143 Cf. Seager (1966) 181; Garnsey (1988) 152, 157.

144 Cf. Figueira (1986) 167f; Osborne (1987) 93; Whitby (1998) 121f.

Rhodes (according to the plaintiff). In practice, the loan of 3000 *drachmae* served to finance several return trips between Rhodes and Egypt.¹⁴⁵ Parmeniscus probably bought various goods at Rhodes from the earnings of the sale of grain and other commodities, which were sold in Egypt, from where a cargo that again consisted largely of grain was shipped to Rhodes.

Parmeniscus travelled along the main sailing routes connecting the main trading centres of the time: from Egypt to Rhodes, from there to Athens. Strabo (*Geogr.* 2.5.24) informs us that there were two routes: a short route across open sea and a much longer route along the coast.¹⁴⁶ Egyptian export trade was largely in the hands of Rhodian traders.¹⁴⁷ Since Dionysodorus and Parmeniscus had accepted a loan which would bind them to Athens as the destination of their cargo as late as August/September, only a few months were left before winter to profit from the current market conditions. The sailing season in the Mediterranean was limited to the months between approximately May and October, thereby reducing the stretch of time for shippers and traders to act upon their information without entailing too much risk. According to the plaintiff, the winter break in the shipping season applied to Athens, but not to Rhodes. Shipping between Rhodes and Egypt continued in winter, whereas ships arriving in Athens late in the year would have had to winter there.¹⁴⁸

This case is not concerned with the distribution of occasional local surpluses: two structural markets – Athens and Rhodes – were supplied from two structural exporters of grain – Egypt and Sicily. Since Athens and Rhodes bought large amounts of grain year after year, it is not surprising that grain traders kept an eye on market conditions in these places. Moreover, a harbour like Athens offered many advantages to traders. As Xenophon notes, Athens offered ‘many classes of goods that are in demand’ to trade at other ports, and also silver, if one did not want a return cargo.¹⁴⁹ Cargoes were important, as is shown by another fourth-century example: one Greek trader found himself in difficulties, when he sailed to the Bosphorus, where a war had broken out with the Scythians. ‘There was no market for the goods that he had brought. He was in great

145 Thus, Zimmermann (1992) 213.

146 Cf. Morton (2001) 220f.

147 According to Casson (1984) 72ff, ‘Rhodes was the greatest figure in the international grain trade of the Hellenistic world.’ Also Rathbone (1983) 52.

148 Cf. Reger (1993) 304: ‘The Greek sailing season in the Aegean ran normally from May to September.’ See also Zimmermann (1992) 212ff.

149 Xenophon, *Poroi* 3.2. Cf. Whitby (1998) 122.

perplexity, for his creditors, who had lent him money for the outward voyage, were pressing him for payment.¹⁵⁰ Moreover, Sicily (especially the kingdom of Syracuse) and Egypt were large-scale market suppliers, which was not only caused by the fertility of these regions, but also by their governmental structures.¹⁵¹ The prevalent tax systems created large surpluses in both Syracuse and Egypt, which were controlled by their rulers, whom we on more than one occasion meet as large-scale grain sellers. In short, these were no 'accidental' surpluses. The role of Egypt in supplying Greece may actually have increased in Hellenistic times, as Egyptian surpluses had previously been exploited by the Persian rulers on their own behalf. The Ptolemies started to export grain on a large scale in order to pay for their requirements of metals, wood, horses and mercenaries.¹⁵²

The oration against Dionysodorus depicts the activities of traders who made good use of the communications between major trading centres to buy a cargo of grain and other goods in one place, and expected to sell it at a profit in another. Athens, Rhodes and Egypt offered clear advantages over other destinations, as regards information, market conditions and/or sailing season. Although traders who frequently visited busy harbours were relatively well informed, the communications between markets were as slow as the freighters that sailed from one to the other. There was always a risk of a competitor arriving at a market earlier, and of prices dropping before one could sell one's cargo.

'Off the beaten track': communication and trading networks

We may juxtapose this account of trade in the age of Demosthenes with another example from Classical Greece, which dates to the early fourth century BC. In his *Hellenica*, Xenophon writes:

The Thebans were now greatly pinched for want of corn, because they had got no crops from their land for two years. They therefore sent men and two triremes to Pagasae after corn, giving them two talents.¹⁵³

¹⁵⁰ Demosthenes 34.8.

¹⁵¹ However, see Rathbone (1983) 50: 'Sicily's reputation as a major grain-supplier to the older Greek cities may be undeserved.' The principal supply region probably was the north shore of the Black Sea. See recently Whitby (1998) 123ff; Rosivach (2000) 40ff.

¹⁵² Thus Rathbone (1983) 51.

¹⁵³ Xenophon, *Hell.* 5.4.56. A comparable case is discussed by Oliver (2001) 143ff: 500 *medimnoi* of wheat and 500 *medimnoi* of barley were bought and sold for a fixed price by the Athenian general Epichares when the north-east of Attica was invaded by Macedonian armies in the 260s BC. Unfortunately, we do not know where and from whom he bought the grain.

The Lacedaemonians, hostile to Phthiotic Thebes (not to be confused with Boeotian Thebes), got wind of the expedition and captured the two ships and their crew, but that is not the interesting point. The city of Thebes lies near the Gulf of Pagasae at a distance of a mere 20km from the Thessalian town that gave its name to the gulf. Although a war was going on – and when was there ever peace in fourth-century Greece? – the story implies that there was grain to be had in Pagasae. Just as the inhabitants of Thebes, who were able to pay for the grain they required, knew that there was grain to be bought in Pagasae, the inhabitants of the latter town must have known of the crisis in the town just 20km away, since two harvests had been lost in the past two years. Despite the short distance across the sea, the duration of the crisis, the apparent wealth of the city and the availability of corn, traders did not come to Thebes to sell grain.

More than once we are told of communities experiencing shortages and sending out ships to obtain grain at external markets. Moreover, Greek cities did everything they could to attract traders to supply the local market. They offered them loans and guaranteed profits, they honoured them in public decrees. Xenophon even advises reserving front seats in the theatre for merchants and shipowners, calling them ‘benefactors of the state’.¹⁵⁴ Apparently, the activities of traders like Dionysodorus and Parmeniscus had their limitations, which made it necessary for Greek communities either to fetch the grain they required from overseas markets themselves, or to add sufficient incentives to attract foreign traders.¹⁵⁵ However, the main strategy of Greek cities was to ensure an adequate home supply as much as possible (in other words, autarky).¹⁵⁶

The case of Dionysodorus and Parmeniscus points to a number of features of ancient overseas trade that may clarify its limitations. Communication and information played a crucial role, since lack of them greatly increased risks and transaction costs.¹⁵⁷ Both were largely

¹⁵⁴ Xenophon, *Poroi* 3.4.

¹⁵⁵ Figueira (1986) 164f; Garnsey (1988) 70ff, 135ff. Persson (1996) 705f remarks that local governments in early modern Europe sent out agents to acquire corn at external markets because of the unreliability of commercial networks. He writes that this practice emerged in medieval times, but, as we have seen, it was already common in Classical Greece.

¹⁵⁶ Thus, Osborne (1987) 104ff; Sallares (1991) 298.

¹⁵⁷ See also the cautionary note by Hopkins (1983) 90, who points to the lack of trustworthy information, the *ad hoc* organisation of credit and the shortage of spending power. However, he seems to argue that these factors only hampered large-scale merchants and thus in effect stimulated the operations of small-time merchants.

determined by the climatic and nautical conditions of ancient seafaring.¹⁵⁸ The small-scale maritime trade largely used small vessels that were ideally suited to coastal shipping, but were less well adapted to the open sea. Ancient seafarers often sailed near the coast, not only because the land offered shelter when the weather changed, but also to make good use of the land and sea breezes that were only to be found near land. During the summer season, winds on the open sea tended to blow in a steady and predictable direction. When sailing in that direction, the open sea offered an important advantage, but not when ships tried to steer a course in the opposite direction to the prevailing winds. For instance, ships that sailed on a northerly course in summer tended to use the land and sea breezes near the coastline.¹⁵⁹ The dangers of sailing in the Mediterranean Sea were not only caused by the risk of bad weather on the open sea, but also by the risks of navigation without instruments. The sailors of antiquity (and later times) mainly relied on the sun and stars and on landmarks for their navigation. Visibility was important to coastal sailing, since shallows and reefs could wreck a ship.¹⁶⁰ The presence of harbours offering protection against storms was also important. Polybius, for instance, says about the coast of the Gulf of Tarentum that it only has harbours suitable for summer.¹⁶¹ The personal experience of Dio Chrysostom provides a nice example of the dangers of Mediterranean shipping:

It chanced that at the close of the summer season I was crossing from Chios with some fishermen in a very small boat, when such a storm arose that we had great difficulty in reaching the Hollows of Euboea in safety. The crew ran their boat up a rough beach under the cliffs, where it was wrecked.¹⁶²

As we have seen (in chapter two), Dio Chrysostom meets a local fellow, who informs him of the dangers of this coast, where many a ship had perished. 'Rarely are any of those aboard saved, unless, of course, like you they sail in a very light craft.'¹⁶³ This was not the only hazardous coast: in antiquity and the Middle Ages, the coasts of Palestine, south Anatolia,

158 Morton (2001) offers an excellent analysis of the nautical conditions of ancient seafaring. His study concentrates on the Greeks' experience of the eastern Mediterranean, but is of great value for our understanding of ancient seafaring in general.

159 Morton (2001) 143ff.

160 On navigation in Greek seafaring, Morton (2001) 185ff. On the technicalities of Mediterranean shipping and navigation, see further Braudel (1966) 103ff; Gelsdorf (1994) 751ff; McCormick (2001) 422ff; Warnecke (2002) 97ff.

161 See also Acts 27:12: the grain ship from Alexandria, on which Paul as a prisoner travelled to Rome, had to leave its harbour at the end of the sailing season, because the harbour was not suited for winter. Recently on this passage, Meijer (2000) 98ff.

162 Dio Chrys., *Or.* 7.2.

163 *Ibid.* 7.7.

North Africa and the Italian side of the Adriatic were seen as dangerous, because they offered few harbours and many obstacles to a safe passage.¹⁶⁴

Because of the differing conditions of coastal sailing and seafaring on the open sea, seafarers chose a route on long voyages that reduced risk and combined the advantages of both. In other words, ships neither hugged the shore, nor did they take a direct approach to their destination across open sea. According to Jamie Morton, ships followed the coast from the port of departure to the point of land that extended furthest into the open sea from where they would set course to a headland on the opposite shore. Often seafarers used islands as intermediate points that offered safety in case the weather changed.¹⁶⁵ Crete and Melos were for instance important stopping points on the shipping lane from Egypt to Greece.¹⁶⁶ Headlands and islands were important means of navigation because they were visible from afar. In addition, long, narrow and shallow gulfs (such as the Adriatic) offered adverse sailing conditions and thus were often avoided.¹⁶⁷

The consequences were that some sea coasts were much less frequented than others. Owing to the climatic and nautical conditions of sea travel, much long-distance shipping adhered to a few safe and well-frequented shipping lanes that connected large commercial centres.¹⁶⁸ The establishment of associations of traders from one port in another in the Hellenistic and Roman period serves as indication of such long-distance shipping routes.¹⁶⁹ In addition, many shippers of small vessels limited their activities to a relatively restricted area, in which they sailed up and down a familiar coast. The Phrygian trader Flavius Zeuxis seems to personify this fact, since a first-century inscription claims that he had sailed 72 times around Cape Malea towards Italy.¹⁷⁰

In his recent study of late antique and early medieval commerce, M. McCormick observes that the nature of Mediterranean shipment and the dangers of navigation 'encouraged many sailors to stick to the waters, or rather, the coastlines they knew best. Such a nautical culture would naturally have fostered zones dominated by local shipping organised

164 Horden and Purcell (2000) 139.

165 Morton (2001) 159ff.

166 *Ibid.* 170.

167 *Ibid.* 148ff.

168 Zimmermann (1992) 210f: The various aspects of shipping 'lassen ein enges Geflecht quantitativ unterschiedlich stark genutzter Seerouten auf dem Mittelmeer vermuten'. Cf. Gelsdorf (1994) 751ff; Warnecke (2002) 100ff.

169 Herz (1988) 136f; Pleket (1990) 132. In Hellenistic times, Davies (1984) 283.

170 W. Dittenberger: *Sylloge*³ 1229. According to Pleket (1990) 35, 129f, (1998) 126, he must have shipped luxury textiles from Phrygia to Rome.

around some main “hub”.¹⁷¹ Related to the fact that ‘western and Byzantine economies were fairly small and dispersed’, he speaks of regional shipping zones, consisting for instance of the southern Tyrrhenian or the Ionian Sea.¹⁷² Braudel made a similar observation, when he emphasised the impact of shipping routes on local development, for instance of Sicily and Sardinia. The latter island ‘was too lost in the sea to play an important role, too far from the enriching contacts that linked Sicily, for example, with Italy and Africa.’ Braudel concluded that the Mediterranean region in the sixteenth century consisted of many ‘half-enclosed local economies’, some of which – Sardinia and Corsica for instance – were outside the main flows of trade.¹⁷³

Long-distance shippers rarely went ‘off the beaten track’.¹⁷⁴ Despite its importance in the corn trade, Polybius has, for instance, the following remark on Byzantium: ‘The great majority of Greeks are quite unfamiliar with the peculiar natural advantages of Byzantium’s situation, since it lies far away from those parts of the world which are frequently visited.’¹⁷⁵ Hence, we may envisage two kinds of sea travel: long-distance shipment between commercial centres, which was stimulated in Roman times by the *pax Romana* and by demands generated by large cities and the Roman government, and shipment within fairly restricted shipping zones. Frequent visitors to many Mediterranean coastlines were only the local shippers, fishermen (who occasionally had a passenger) and pirates. It seems that we should at least differentiate between many kinds of ‘connectivity’, some of which made little impact on the local economy.

The activities of Dionysodorus and Parmeniscus show the all-importance of good information and fast communication to such traders, as prices could change rapidly and unpredictably, as a result of the possible arrival of their competitors’ shipments. This is nicely illustrated by a story in Cicero’s *de officiis*: during a famine on Rhodes, a trader conveys grain from Alexandria to the island. He knows that more ships with Egyptian grain are under way, but his moral dilemma is: should he share this information with his customers, or should he sell at the highest possible price?¹⁷⁶ (Note that Cicero’s story also deals with Rhodes and

171 McCormick (2001) 422.

172 *Ibid.* 538. Similar is the characterisation of the Hellenistic trade by Gibbins (2001) 294, who speaks of coastal trade routes within established economic regions, which gave the Mediterranean ‘a cellular appearance’.

173 Braudel (1966) 150, 382.

174 Horden and Purcell (2000) 137ff. See also McCormick (2001) 93ff.

175 Polybius 4.38.

176 Cicero, *Off.* 3.50.

Egypt.) Timely information was important to reduce the risks of the grain trade. In 1578, for instance, a famine struck Spain. In response, the viceroy of Sicily urged the Sicilian merchants to send a large shipment of corn, but they hesitated, 'for it may happen that everyone hastens to the place where he thinks there is most profit and there is an overabundance of grain'.¹⁷⁷ Although the plaintiff in Demosthenes' oration paints a picture of conspirators who manipulate the market to their profit, we may assume that the frequency of overseas traffic between Athens, Rhodes and Egypt facilitated the communication of price levels and of future harvests between such centres of trade.

Good information on market conditions was much easier to obtain along the busy shipping lanes than on isolated coasts.¹⁷⁸ The frequency of traffic between commercial centres and the reliable contacts that most traders must have had in such harbours, provided them with timely and trustworthy information regarding future needs and price developments. According to Polybius, Byzantium may have had a similar position: 'In the case of corn there is a two-way traffic, whereby they sometimes supply it when we need it, and sometimes import it from us.'¹⁷⁹ Agents who provide information on market conditions are likely in such a context. In contrast, it is unlikely that reliable information on the conditions of the food supply in rarely visited towns along the northern parts of the Adriatic Sea or on the coast of Mauretania was current on the grain markets of Athens, Ephesus or Carthage. Both the recentness and reliability of the information declined rapidly as the number of intermediaries and the distance increased.¹⁸⁰ According to Demosthenes, the merchant Phormio sailed to the Bosphorus from Athens, where he found to his dismay that because a war had broken out, 'there was no market for the goods that he had brought'.¹⁸¹ Larger cities offered the additional advantage that the market situation was not so easily overturned by one shipment. On Hellenistic Delos, for instance, the price of wheat seems to have been structurally higher than in Athens. Gary Reger points out that the small scale of demand put Delos at a disadvantage against a market like Athens, because one ship could carry enough grain to feed the island for a month

177 Quoted from Braudel (1966) 575.

178 See also Morley (1996) 72, who points out that it was not in the interest of merchants to spread information about good market conditions elsewhere.

179 Polybius 4.38.

180 Cf. Pelizzon (2000) 118f on the lack of trustworthy information in peripheral zones.

181 Demosthenes 34.8.

and thus cause prices to drop significantly. Hence, larger markets tended to offer more price stability than small ones.¹⁸²

Moreover, the time to respond to information on price levels in distant markets was limited by growth cycle and sailing season. In most islands and coastal regions of the Mediterranean, grains are harvested in late spring or early summer. Farmers had some means of responding to damage done to standing crops early in the growth cycle, for instance by drought after sowing or flooding in winter. In such a case, grains that ripened quickly or that could withstand heat and drought (such as millet) could be sown in early spring. However, harvests that failed due to floodings or the untimely arrival of hot and dry weather in spring (let alone the damage done by passing armies) could not be compensated. In most years, the size of the harvest manifested itself often only in spring or early summer. Except in the case of totally failed harvests (which may have been relatively uncommon), conditions of dearth arose only months afterwards. As the accounts of many shortages show, extremely high prices that reflect famine conditions usually occurred when stocks were depleted in winter or spring. By that time, the sailing season was closed.

The risks of shipping in the period from November to April provided a serious obstacle to overseas trade. The danger of wintertime shipping was caused by the changeability of the weather, which made it difficult to predict the direction of the wind and to plan a safe route. The risk of violent storms increased, and seafarers needed to be constantly aware of the necessity to find shelter nearby. Wintertime sailing was also made more dangerous because clouds, rain and mist obscured landmarks and hampered navigation. Coastal sailing in unknown territory was dangerous during summer, but even more so in winter, when sandbanks, cliffs and other dangers were less visible.¹⁸³ The fourth-century AD military handbook by Vegetius gives the period of 27 May to 14 September as safe, and from the latter date to 11 November as 'doubtful and more exposed to danger'. From 11 November to 10 March, the sea is closed: *mare clausum*.¹⁸⁴ The situation of cities that were dependent on imports during the

182 Reger (1993) 330f.

183 Casson (1971) 271f; Rougé (1981) 22f; Morton (2001) 258ff.

184 Vegetius, *Epit.* 4.39. Cf. *Cod. Theod.* 13.9.3. On Vegetius, Schenk (1930) 76ff, who concludes that Vegetius' information ultimately derives from Varro. See further Braudel (1982) 247ff; Casson (1971) 270f; Rickman (1980a) 15; Rougé (1981) 15ff; Meijer (1986) 227f; Gelsdorf (1994) 752; Warrior (1996) 33f, 63f, 95f; McCormick (2001) 98, 450ff; Warnecke (2002) 102f. On *Cod. Theod.* 13.9.3, Tengström (1977) 44f. For a different interpretation, see Sirks (1991a) 42f; 156. According to him, the corporations of shippers were obliged to move cargo during the summer half of the year, but were not required to do so from November to April. See also Sirks (2002)

sailing season was vulnerable. See for instance the following report, which was sent by the *praefectus urbi* Symmachus to the emperor Valentinian II in AD 384:

The summer is far advanced: very little has been shipped from African harbours and we experience a touch of fear, not groundless, that the corn supply has got into serious difficulties. . . . I ask you to send some energetic men to produce in visible form, while sailing is still feasible, the cargoes on which we are accustomed to rely for the victualling of the city.¹⁸⁵

Throughout antiquity, mention abounds of the hesitation to sail in winter, although many of these remarks on the dangers of wintertime sailing are prompted precisely by the decision to take to sea in spite of the danger involved. Moreover, some parts of the Mediterranean were less dangerous in winter than others. According to the plaintiff in the case against Dionysodorus, shipping continued in winter between Egypt and Rhodes.¹⁸⁶ Although there are many examples of shippers in antiquity and later times who accepted the risks of wintertime sailing in the pursuit of profit, it cannot be denied that the range and volume of wintertime shipping was very limited. Although McCormick points to a significant amount of shipping during winter in the early Middle Ages, he clearly observes a peak in sea travel during spring and summer.¹⁸⁷ Consequently, in winter the news on current market conditions in the various parts of the world travelled slowly¹⁸⁸ and not very far – or not at all. Even letters from the imperial administration or news on the death and succession of Roman emperors travelled slowly in winter. For instance, a letter about the emperor Gaius' death, that was sent in December, only reached the governor of Syria at the end of March, three months after the emperor had died.¹⁸⁹ Furthermore, the threshold for responding to high prices was

141f. Peña (1998) 159 points out that a law of AD 412 required African taxpayers to deliver part of their payments before August or September, i.e. in time for the taxed goods to be shipped to Rome before the sailing season ended. In general, regulations concerning the timing of tax payments were closely connected to the sailing season (Peña (1998) 160, 165, 198f, 206). On the seasonality of seafaring in the Greek world, see for instance Snider (1978) 129ff; Wallinga (1993) 1f.

185 Symmachus, *Rel.* 18. Transl.: Barrow (1973). See also *Rel.* 35, concerning olive oil.

186 Cf. Morton (2001) 259f.

187 McCormick (2001) 452ff. Cf. Udovitch (1999) 274 in his study of medieval Egypt's textile trade: 'the peak of commercial activity occurred annually during the months of April through September, the sailing season on the Mediterranean.'

188 Thus, Braudel (1966) 361. Regarding Rome, also Kolb (2000) 309; Temin (2001) 179.

189 This example is given by Duncan-Jones (1990) 26, whose excellent article analyses how fast news on successions and official business travelled, and concludes that the shipping season played an important role in seasonal patterns.

much higher than in summertime. Hence, most regions that experienced shortages in winter could expect relief only over short distances, or after the sailing season had started again. In short, the dangers of wintertime shipping added to the limitations of communications and increased the problems of relatively isolated coasts in attracting foreign merchants.

Although we have concentrated on local shortages, the problems were similar for those regions that had experienced an exceptionally good harvest. Regions that did not normally export depended just as much on overseas communications as those that did not normally import. It was surely no coincidence that, in the above case, Athens attracted supplies from such exporting regions as Egypt and Sicily. In regions of small-scale, self-sufficient production, grain did not usually go further than the nearest markets. Hence, regions that did not normally export grain lacked the infrastructure to gather surpluses and sell them to traders who were looking for a good cargo.¹⁹⁰ This was not only a question of port facilities, but also of merchants who acted as middlemen and investors who offered credit. Even apart from the risks involved, maritime trade was a costly business, requiring capital for the vessel itself and for the cargo and crew. Transaction costs increased the threshold in long-distance trade. Costs may have been lower and capital certainly more available in commercial centres than in peripheral regions. The trade in high-value goods was less restricted by such costs than bulk goods like grain or wine.¹⁹¹ In short, it was difficult to tap the resources of isolated regions in the short term.

Traders favoured those ports that offered not only an opportunity to sell their cargo, but also to buy commodities that would fetch a good price elsewhere. The importance of return cargoes is indicated in a case discussed by the jurist Scaevola – an important lawyer on the council of Marcus Aurelius:

Callimachus took a maritime loan from Stichus, the slave of Seius, in the province of Syria, from the city of Beirut to Brindisi. The money was lent for the whole period of two hundred days of sailing, under pledge and mortgage of all merchandise to be bought in Beirut and to be brought to Brindisi and all he would buy in Brindisi and transport by ship to Beirut. And it was agreed between them that once Callimachus had arrived in Brindisi, he would leave by the next

190 Compare Philips (1987) 558: 'Western Catalonia also normally produced a surplus, but high transport costs and a poor distribution network made the surplus difficult to export.'

191 Cf. Epstein (1992) 269. Hitchner (1993) 501 points out that the 'booming' olive production in Africa and Spain in the imperial period could profit from existing trade links with external markets.

Ides of September, after buying and loading other goods onto a vessel by means of which he would travel back to Syria.¹⁹²

This case is interesting in several respects: first, it illustrates the commercial link between two ports. The contract left little room for trading outside these two ports. As in the case of Demosthenes, the maritime loan that financed the enterprise determined at the outset which ports were to be visited. Since Callimachus was to return to Beirut before the Ides of September, there was little scope for deviation from the shipping route that connected the two ports. Secondly, it emphasises the importance of the shipping season. According to law, the risk of shipwreck fell to the lender. The above contract shows that the risk of shipwreck was shifted to the merchant Callimachus, if he had not left Brindisi by the Ides of September. Boudewijn Sirks observes: 'It is evident from the conversion of the loan on the Ides of September that the lender wanted to avoid his loan being exposed to the risks of the bad sailing season.'¹⁹³ Thirdly, this second-century case from the *Digest* illustrates the need to find a profitable return cargo.

Rome may have been an unattractive destination – and therefore have needed additional stimuli to attract seafaring merchants – because it had little to offer as a return cargo. Of course, Ostia offered other advantages: there were few harbours in the Roman Empire that attracted as many merchants from all over the known world. Ostia, therefore, offered many opportunities to get reliable information and to strike deals with traders and businessmen for future transactions. In addition to the main cargo that was destined for Rome, many ships may have contained commodities that traders could buy to sell elsewhere. Nevertheless, every year, hundreds of ships, maybe thousands including the very small ones, docked in Ostia/Portus in order to bring huge amounts of grain, wine, olive oil, wood, stone, bricks, marble, fuel, and so forth to the city. It remains probable that, whatever Rome may have exported, it left a large volume of transport capacity on the return voyage unused and unpaid for.

Moreover, price levels differed throughout the Mediterranean region. Under normal conditions, prices were higher in large cities like Ephesus than in backward areas, and higher still in a city like Rome.¹⁹⁴ The second-century jurist Gaius realised that neither products, nor money itself had the same value throughout the empire:

192 *Digest* 45.1.122.1. For a discussion of this case, see Sirks (2002) 142ff.

193 Sirks (2002) 146.

194 See Duncan-Jones (1982) 345f.

. . . we know how prices of things vary from one city and region to another, especially of wine, oil and corn. Even in the case of money, though it is supposed to have one and the same purchasing power everywhere, yet it can be quite easily raised and at low interest in some places, with difficulty and at steep interest in others.¹⁹⁵

The rural populace and the inhabitants of small towns in many regions lacked the purchasing power to pay high prices. In early modern Europe, famine prices were lower in regions where consumers were poor. The need might be no less pressing than in other regions, but prices would rise not as high.¹⁹⁶ Hence, failed harvests did not automatically turn commercially underdeveloped regions into attractive consumer markets.¹⁹⁷

The above arguments are not offered as a challenge to the idea that the features of the Mediterranean stimulated the compensation of local glut and shortages by overseas trade. The geographical and climatic fragmentation of the Mediterranean lands meant that the size of harvests varied locally, while the small-scale nature of maritime trade stimulated the exchange between local regions. However, the degree of connectivity should not be exaggerated, even along the Mediterranean coasts of the Roman Empire. The workings of overseas trade favoured the commercial centres that were part of a network of long-distance communication and trade. The coasts and islands along the most frequented shipping lanes profited as well from the frequency of shipment, as for instance Lycia, which was on the route taken by the grain ships coming from Alexandria.¹⁹⁸ Away from this network, small-scale shippers offered connectivity on a much more regional scale. Communications between such regions and the outside world were slower and less reliable. Besides, overseas trade did not respond to local variation in harvest size, but to the promise of profit. If an enterprise promised a chance of high profits, high risks were accepted. However, commercial centres offered both higher profits and fewer risks than backward regions; traders knew the market and the merchants could count on a return cargo and on a wealthy consumer market.

The example of early modern Europe shows that communication and trading networks played a crucial role. An integrated market that

195 *Digest* 13.4.3. Also 35.2.63.2. Even money did not have the same value throughout the empire. Crawford (1970) 43 points out that the *denarius*, officially equal to 16 *asses*, was valued at 18 or 20 *asses* at various times and places.

196 Wrigley (1989) 247f.

197 Braudel (1966) 152 points out that in the 16th century, Mediterranean islands such as Corfu, Crete and Cyprus 'were constantly threatened by famine'.

198 Zimmermann (1992) 215f.

contained more and more parts of Europe and the rest of the world slowly emerged in the eighteenth and nineteenth centuries. Improvement of communication contributed significantly to this development. In the words of K.G. Persson: 'Dramatic changes in transport costs probably accounted for little of the new phase in market integration; what counted was the slow emergence of a robust trading network and homogeneous information penetrating Europe at a faster rate.'¹⁹⁹ A comparable improvement of communication and trading networks undoubtedly occurred with the rise of the Roman Empire, but not all regions profited equally from this development. Moreover, the compensation of glut and shortage was not only a matter of demand, but also of supply. Many regions that experienced glut did not increase their market output proportionally. Hence, the idea that local harvest fluctuations averaged out at a total mean of zero is wrong. Structural exporters of grain responded better to local short-run market developments than 'accidental' surplus producers. Connectivity and isolation were unevenly spread across the Mediterranean world. Somewhat simplified, we may distinguish a core, consisting of a 'global' network of commercial centres and those regions that were lucky to be situated along busy shipping lanes, and a periphery that contained economic zones that were at best regionally integrated, at worst underdeveloped and isolated.

Price differences and regional economies

In Roman times, price differences existed between various regions of the Empire. First, one may point to a passage in Polybius, who is astounded by 'the cheapness and abundance of all articles of food' in Cisalpine Gaul:

[Cisalpine Gaul] produces such an abundance of corn that often in my time the price of wheat was four obols per Sicilian *medimnus* and that of barley two obols, a *metretes* of wine costing the same as the *medimnus* of barley.²⁰⁰

While Polybius explains the cheapness of prices by the fertility of the region, it is clear that also the absence of much export contributed to the low price level. It was detrimental to the region's economic development that the river Po flowed into the Adriatic Sea, which had a bad reputation because of its dangerous coasts and lack of good harbours. At least in

199 Persson (1999) 100. See also Chartres (1985) 465ff on the importance of newspapers in the English grain market. Volckart (2002) 311 on lack of information increasing transaction costs in early modern Europe.

200 Polybius 2.15.1–3.

Republican times, the Adriatic Sea did not have a populous and wealthy city on its coast. Neither Ravenna nor Brindisi developed into large commercial centres, despite the good harbours both cities possessed.²⁰¹ Aquileia was to be the most important city, but its rise came much later than Polybius' lifetime and was probably related to the Roman military presence to the north.²⁰² Hence, in the second century BC, the productivity of agriculture in Cisalpine Gaul found no outlet to overseas markets.²⁰³

Again, Cicero turns out to be a valuable observer of Mediterranean conditions, when discussing the practice of provincial governors of allowing communities to contribute money instead of grain to Rome. The original purpose of this practice, Cicero says, was to spare taxpayers in isolated areas the excessive cost of hauling large amounts across the province. As an example, Cicero points out the price difference between Philomelion in Phrygia and Ephesus on the coast of Asia:

I know the usual differences between the prices of corn at those two places; I know how long the journey takes. I know that it suits the farmers of Philomelium to pay, there in Phrygia, a cash sum corresponding to the price of corn at Ephesus, rather than transport the corn to Ephesus or send agents to Ephesus with money to buy corn there.²⁰⁴

Then he explains why Verres' use of the same measure amounted to abuse of power, since he forced the communities to contribute money at a high rate, while they would have preferred to deliver the corn:

This commutation system is therefore effective in Asia, effective in Spain, effective in any province where the price of corn is not commonly the same everywhere. But in Sicily, what could it matter to anyone where he delivered his corn?²⁰⁵

In other words, there was no one level of corn prices in regions like Asia and Spain, unlike Sicily, which was small enough for transportation to even out local differences.²⁰⁶ Cicero may have exaggerated the price uniformity in Sicily, since it strengthened his argument against Verres. In sixteenth-century Sicily, prices differed even in the various ports along

201 Finley (1985) 129.

202 In the 3rd century AD, Herodian 8.2 pointed out Aquileia's favourable location towards the Illyrian provinces.

203 See mainly Brunt (1971) 172ff. Pritchard (1971) 224 sees Sicilian and African imports of corn as the main cause of the low grain price in Cisalpine Gaul.

204 Cicero, 2 *Verr.* 3.191. Cf. Herz (1988) 61; Mitchell (1993) I 247.

205 Cicero, 2 *Verr.* 3.193.

206 Cf. Simpson (1995) 87f regarding regional extremes in 19th-century Spain.

the coast, which partly reflected differences in risk and costs of freight and insurance.²⁰⁷ An indication of the market fragmentation in Sicily is also provided by the fact that each region continued to use its own grain measure. Until the nineteenth century all attempts by central authorities to standardise measures (not so much in the interest of trade as to facilitate taxation) failed.²⁰⁸ The point remains that prices differed little in Sicily in comparison with much larger provinces. Price differences in Spain or Asia reflected high transportation costs that severely limited the ability to even out regional differences in supply and demand.

Another example derives from an oration by Dio Chrysostom concerning a food shortage that caused a riot in his native Prusa around the year AD 100. Dio Chrysostom admonished the citizens not to make such a fuss about the price of corn. 'Why, there are cities in which it always is at that price, when conditions are best.'²⁰⁹ Roman law reflected this reality in the clauses about location of promised payments and deliveries. The *Institutiones* of the emperor Justinian illustrate this principle by the ruling that no one could be obliged to deliver the same amount in Rome as had been promised in Ephesus, because price differences would make this an unjust claim. 'Regarding commodities like wine, olive oil and grain, of which the prices differ in various regions, the advantages would usually be very large.' Not only differences in location were recognised, but also in time: it is observed that olive oil will not only differ in price in Rome and in Spain (the main supplier), but also in years of good or bad harvests.²¹⁰

Price differences in inland areas were much larger than in coastal regions, because the high cost of transportation over land virtually ruled out the conveyance of large amounts of corn across any meaningful distance inland. Under normal conditions, overland transport costs were sufficiently high to rule out the exchange between neighbouring regions, despite existing price differences. As the price of grain in one location rose, the threshold for conveying grain from neighbouring regions lowered. Nevertheless, even if dearth caused prices in inland regions to rise to a multiple of those elsewhere, the cost of transportation overland would soon exhaust the profit margins of traders willing to undertake the

207 Davies (1983) 376. Cf. Epstein (1992) 147ff who concludes that regional market integration was weak, but increasing during the late Middle Ages.

208 Epstein (1992) 120ff.

209 Dio Chrys., *Or.* 46.10.

210 *Inst.* 4.6.33c; *Digest* 35.2.63.2. On the interpretation of the latter passage, Cahn (1969) 31f. Also, *Digest* 13.3.4; 13.4.3. Cf. Hopkins (2000) 261: 'Rome was at the peak of a pyramid of rising prices.'

effort. As far as the distribution of grain was concerned, inland regions in antiquity were truly isolated. Hence, when the army of Agesilaus threatened to destroy the standing crops of the Acarnanians in the spring of 388 BC, the latter surrendered immediately and entered into an alliance with the Lacedaemonians, because, as they said, their inland situation made their food supply extremely vulnerable.²¹¹ Furthermore, when the fields in Aemilia lay bare as a result of the war against the Goths in the fifth century AD, the inhabitants fled to neighbouring Picenum, on the coast of the Adriatic Sea, expecting that the famine would be less severe there.²¹² It turned out that the hope of rescue from abroad was false. Procopius claims to have been present in the region at the time and paints a vivid picture of mass starvation.

Local prices are determined by local conditions of production and distribution, and, in the case of imports, by transportation costs. Prevailing price differences indicate the limitation of the integration of the corn markets throughout the Mediterranean region. Two elements may be distinguished that explain the regional price differences in the Roman Empire. First, transportation costs. If the price of grain in place A is higher than in place B, but the difference is lower than the cost of transporting grain from B, then it is not worthwhile to export grain from B to A. Until the nineteenth century, the threshold was high. John Bintliff concludes that throughout the Roman Empire, 'the prime consumption of rural surplus was in local towns rather than distant markets'.²¹³ If shortages occur in place A, the price difference may rise above the cost of transport, and exports from B to A may occur. Hence, even in an integrated market the prices of the same product are not necessarily the same throughout the integrated region. If place A consumes imports from place B, prices at A may be structurally higher than at B, because of transportation costs. In other words, differing price levels do not necessarily contradict market integration.

Regarding early modern Europe, in order to establish the degree of market integration between two places, economic historians analyse the extent and interconnectedness of price volatility.²¹⁴ The so-called single price law states that 'arbitration between different markets permits an effective equalisation among prices within a normal uneliminable

211 Xenophon, *Hell.* 4.7.1.

212 Procopius, *Bella* 6.20.18.

213 Bintliff (2002) 230ff.

214 On the measurement of market integration, see in particular Chevet (1996) 681ff; Persson (1999) 93ff. Regarding Rome, see recently Temin (2001) 179.

short-term margin'.²¹⁵ In other words, a change in price in place A will affect the price in place B in the same direction. The workings of this law are as follows: a price rise in A will stimulate import from B; as a consequence prices will rise in B, until a level is reached that cancels the increasing price difference that stimulated the exchange. A price decrease in A will have a similar result, though in the opposite direction. If prices in different regions act independently, the markets are not integrated.

Transportation and transaction costs determine the threshold of inter-regional exchange and explain a large part of existing price differences. The economic rule that 'commodity prices decline as distance to the market increases because transport costs increase' was as true in ancient as in modern times.²¹⁶ Columella reflects this situation when he writes that wheat is unsuitable as fodder for fowl 'even in places where it is very cheap'.²¹⁷ Or:

Barley by itself or chickling-vetch crushed with beans is too expensive to be provided at a reasonable price in districts near towns. But, wherever their cheapness allows, they are undoubtedly the best food.²¹⁸

Columella knew that the presence of urban markets generally drove up local prices.

Ancient sources do not provide good evidence on transportation costs over land or sea. The most obvious source is Diocletian's price edict of the year AD 301. However, it contains, for example, the tariff of a muleteer or the costs of hiring a waggon, which are not the same as transport costs. Moreover, the edict mentions maximum tariffs, which may reflect current market prices very inadequately, and local differences not at all.²¹⁹ An important factor in the costs of overland transportation was the seasonal and part-time nature of much of the work. The reproductive costs of much of the labour was transferred to agriculture, which lowered the threshold of overland transport.²²⁰ Nevertheless, the cost of overland transportation was high,²²¹ and while this does not rule out a significant volume of long-distance overland trade of relatively high-value low-bulk

215 Chevet (1996) 687.

216 Quote from Benirschka and Binkley (1995) 512.

217 Columella 8.4.1.

218 Columella 7.3.22. See also Duncan-Jones (1982) 346, who suggests that grain prices in the East were substantially higher in large towns than they were outside.

219 Von Freyberg (1989) 62; Polfer (1991) 287ff; Morley (1996) 63ff; Horden and Purcell (2000) 377. On calculating costs of overland transport in Roman times, Laurence (1998) 130ff.

220 Erdkamp (1999) 564ff. Cf. Mitchell (1993) I 246.

221 On overland transport costs in the early modern period, see Braudel (1966) 576f; Ringrose (1970) 84f.

goods, it did make the overland trade of staple foods over long distances impossible. In the words of Peter Temin: 'The Roman market for bulk commodities extended only slightly beyond where ships could go.'²²² Ray Laurence's recent reappraisal of the importance of land transport cannot change this fact. Land transport was indeed crucial, if only to convey bulk goods to waterways. However, as far as bulk goods of relatively low value were concerned, it was limited to short distances. This is not just theoretical cost-benefit analysis (which is supposed to be alien to the Roman world²²³); long-distance transportation of grain overland was impossible, because the input required by way of human and animal energy – and, thus, consumption – would make it impossibly ineffective.

The fact that prices of grain near towns were higher than further away indicates that the transport costs over land limited the conveyance of grain to towns to a relatively short distance. It is difficult to put a figure on the distance at which grain markets were integrated over land. Mitchell mentions a distance of 50 miles (80km) – or a three-day journey for a loaded waggon – as a maximum for the grain trade in Anatolia. Ringrose notes that the activity of early modern Spanish peasants, who exchanged their surpluses over a distance of 80–120km, may explain the similarity of price movements between neighbouring regions in inland Spain.²²⁴ It seems likely that this represents the maximum radius of the overland conveyance of grain under normal price conditions.²²⁵ However, owing to the nature of this transport, it applies only to a relatively limited volume of trade. Large-scale conveyance of grain over such a distance is unlikely. One may add that the distribution of lesser grains was even more restricted by transport costs than that of wheat. Since transportation costs of various kinds of grain were equally high, transportation costs were

222 Temin (2001) 180. See also Jongman (1988) 78f; Martin (1990) 302; (2002) 151f; Mitchell (1993) I 246; Morley (1996) 67. Concerning early modern Europe, Langton (1998) 388.

223 It is important, however, to correct those views that discard any role for overland transport. Laurence (1998) esp. 136. Cf. Polfer (1991) 291; Rickman (1991) 109; Paterson (2001) 373.

224 Ringrose (1970) 73.

225 Fellmeth (1998) 314 assumes that agricultural wares were conveyed to towns over a distance of at most 20km. He may be referring to the radius of 15–20km that is typical for the catchment area of a local market town in pre-industrial societies. A survey of such research and its implications for the Roman world is presented by Bintliff (2002) 212ff. However, the radius of day-to-day market transactions (and thus the catchment area of local markets) is not the same as the maximum radius across which agricultural surpluses are traded. Similarly, Rosivach (2000) 57f (esp. n. 81) argues that the distance between Athens and 'the corners of the Attic countryside' exceeds the range of overland transportation. Rosivach relies on Donald Engels' inflated figures on the low carrying capacity of pack animals and on some modern examples that are taken out of context. In short, both estimates are much too low.

proportionately higher for cheaper grains. Hence, the market for lesser grains was even more fragmented than for wheat.²²⁶ Interestingly, even such a cheap product as lentils were exported from Egypt to Italy. Pliny the Elder mentions that the large vessel that carried an obelisk to Rome by orders of the emperor Gaius carried 120,000 *modii* of lentils as ballast.²²⁷ While high transportation costs over land almost ruled out the conveyance of cheap grains beyond a relatively short distance, such grains were transported by sea over large distances.

Though lower than the cost of overland transportation, the costs of long-distance shipments were still considerable. 'The difference between purchase and sale prices had to be sufficient to absorb the costs of transport, handling in the ports, customs duties, and the great risks of shipping, and still leave a reasonable profit to the merchant and his agents.'²²⁸ Even in the eighteenth century, the cost of shipping grain from the Baltic to Western Europe amounted to 50 per cent of the current prices at the Amsterdam grain market.²²⁹ It is also important to stress that losses were large during overseas transport.²³⁰ The prices in Diocletian's edict on overseas transport are actually maximum tariffs for freighters along various shipping routes. They fail to take into account various factors that determined the real cost of overseas transportation, such as weather, time of year, insurance etc.²³¹ Duncan-Jones has pointed out that Diocletian's price edict seems to downplay the actual costs of overseas transport. 'The sea transport cost is so low that the implied cost of carrying foodstuffs by water is almost negligible in relation to distances within the Mediterranean.'²³² Consequently, modern historians have tended to overestimate the ease and cheapness of long-distance shipments in Roman times. Overseas transport in Roman times was only 'cheap' in comparison with overland transport. The limiting impact of the cost of

226 Rathbone (1983) 46: 'Wheat held a significant advantage over barley, since in terms of volume it had some 35% greater nutritive value and up to 100% greater cash value.' However, a 'standard price ratio' between wheat and barley of 2:1 has been criticised by Reger (1993) 306ff. Cf. Chartres (1985) 460ff; Persson (1999) 66.

227 Pliny, *Hist. nat.* 16.201.

228 Hybel (2002) 242 regarding medieval trade.

229 Persson (1999) 67.

230 E.g. in modern Mozambique: 5% loss in shipping maize. Arndt and Tarp (2001). Galsterer (1990) 31 and Rickman (1991) 111 even reckon with a loss of about 25–33% in the grain supply of the city of Rome.

231 Hopkins (1983) 103.

232 Duncan-Jones (1982) 368. Also Von Freyberg (1989) 62f; Polfer (1991) 289f; Mitchell (1993) I 246.

overseas transport (including manual loading and unloading) was far from negligible.²³³

The second element to be distinguished consists of the conditions of trade: the inadequacy of communication, the slowness of transportation, the absence of sufficient purchasing power and of profitable return cargoes. These limitations added a further threshold to market exchange, but the threshold was not equally high across the Roman Empire. This may explain why, in general, prices varied not only inland, but also in the various parts of the Mediterranean region, and why the low prices of all foodstuffs in second-century BC Cisalpine Gaul did not lead to exports, and why coastal Picenum was more likely to suffer a deadly famine than Carthage or Antioch. Regarding the sixteenth century, Braudel observed that 'it was the inner region of the Mediterranean, with easy access to shipping routes, which could best afford the luxury of a grain trade.'²³⁴

Even the relative ease of overseas transportation, which the seas surrounding Greece offered, was not sufficient for one integrated corn market over a wide geographical range to emerge.²³⁵ In a recent examination of the records of the public purchase of corn on the island of Delos in Hellenistic times, it is stressed that despite regular long-distance movement of grain between suppliers and consumer markets (especially Athens), there was nothing like an international corn market for the Greek world. Instead, it is concluded that Delos and its neighbouring islands formed part of 'a relatively isolated regional market'.²³⁶ The fact that prices on Delos were much higher than those in Athens reveals the lack of market integration. 'The conclusion seems inescapable that wheat was chronically and structurally very expensive on Delos.'²³⁷ According to J.K. Davies, it is clear that there was no integrated 'Hellenistic economy' over a wide range of goods. The question should rather be in what ways the various sectors and local and regional economies *were* interconnected.²³⁸

233 Cf. Braudel (1966) 578; Reinhardt (1991) 99.

234 Braudel (1966) 578.

235 See also Pleket (1993b) 330: 'We are facing systems in which short-haul transport of local products prevailed.'

236 Reger (1993) 329ff. In contrast, Casson (1984 72ff), assigns Delos local importance in the international corn trade serving the Eastern Mediterranean.

237 Reger (1993) 316f. However, Reger's procedure for calculating the price level on Delos is criticised by Sosin (2002) 137ff.

238 Davies (1984) 270f, also 284f. Osborne (1987) 104, remarks regarding Classical Greece that 'the under-development of trade and the determination to be self-sufficient in food were closely related one to the other.' A more optimistic opinion regarding the role of trade in Garnsey (1988) 70ff. Also Hahn (1983) 33ff; Fulford (1987) 58–75.

Further confirmation may be found in Alston's analysis of Oxyrhynchus' trade network. Despite the availability of cheap river transport, significant trade contacts only extended about 165km to the north and south. Apart from Alexandria, the majority of contacts were limited to Middle Egypt. In general, it is concluded that trade in Egypt operated on a district level, which was focused on the urban centre, and a regional trade network. However, on the basis of his analysis of the prices of wheat, wine and donkeys in Roman Egypt, Dominic Rathbone has recently claimed that the markets for these goods in Middle Egypt were 'in broad terms' integrated. Regarding wheat, he points out that 'there is no discernible difference in the structure of prices between the Arsinoite, Oxyrhynchite and Hermopolite nomes',²³⁹ which implies that the wheat market between these regions was integrated. Actually, the available evidence merely attests that wheat prices in these regions were within the same broad range in roughly the same period. Even regarding Roman Egypt, the statistics are too crude to prove a high degree of market integration. On the one hand, it does seem likely that prices could not vary much between neighbouring nomes in Middle Egypt without triggering interlocal trade. On the other hand, harvest fluctuations cannot have varied much between these regions, since annual variations in the flooding of the Nile affected the various nomes equally. In other words, the similarity in the structure of prices within Middle Egypt need not imply significant market exchange. That being said, short-range market integration in Middle Egypt seems entirely probable, though unproven.

Conclusions

Price differences within the Roman world not only reflect differing transportation costs, but also regional variation in the conditions of production, transport and the market. The corn market seems largely to have operated within restricted, sometimes isolated regions.²⁴⁰ This is not to deny that some goods were distributed over long distances, even Empire-wide. On the one hand, the grain market was larger in volume, on the other, it was more restrained geographically than the trade in perfumes, papyrus or textiles.

239 Rathbone (1997) 192, 212f. On p. 197 it is implied that this 'broadly integrated' wheat market comprised all of Roman Egypt (cf. p. 191). On the wine market, see also p. 200. Bagnall (1997) 57 also assumes that prices in Egypt were fairly uniform and determined by the world market.

240 Alston (1998) 183, 188ff. Concerning wine, see Ruffing (2001b) 79 for a similar conclusion.

The market in the Roman world did not perform significantly worse than in early modern Europe. In the Mediterranean world of the sixteenth century, the grain market operated predominantly on a small scale. According to Braudel: 'typically, grain purchases were made locally, within a closed economy and a small radius. Towns drew on the granaries of the surrounding countryside. Only large cities could afford the luxury of importing such a bulky commodity over long distances.'²⁴¹ This reads very much like Hopkins' analysis of the Roman world: 'Most of the agricultural surplus was transported by farmers to their local market town and consumed there. [. . . Except for Rome and the few other large cities,] all other towns lived mostly off the produce of their immediate hinterland.'²⁴² In view of Cicero's remarks on Sicily, it may not be surprising that this region was among the earliest in early modern times to develop high levels of market integration and specialisation, where large estates produced mainly cereals, while small farms cultivated cash crops and offered seasonal labour for their wealthier neighbours. Specialised farming in Sicily and in southern Italy relied upon developed labour markets and 'upon competitive product markets which redistributed output relatively efficiently'.²⁴³ However, in eighteenth-century France, just as in Roman Spain or Asia, various regional corn markets coexisted whose price-setting was independent.²⁴⁴ In Spain, the lack of national or regional grain markets prevented the alleviation of food shortages until well into the nineteenth century.²⁴⁵ The pre-industrial era of food supply waned with the introduction of newspapers and postal services in the eighteenth century, and finally ended in the nineteenth century with the emergence of the railways and canned food, which eased the exchange of food in time and space.

²⁴¹ Braudel (1966) 570. Epstein (1992) 137ff offers confirmation of Braudel's picture regarding late medieval Sicily.

²⁴² Hopkins (1983) 94. See, for example, Mitchell (1993) I 242 on Roman Anatolia.

²⁴³ Epstein (1998) 93.

²⁴⁴ In his study of market integration in France, Weir (1989) 206ff concludes that in the 18th century there existed several regional corn markets in France, the price developments of which show no correlation. See also, Braudel (1990) 380; Chevet (1996). In contrast, Chartres (1985) 460 concludes that England had developed an integrated, national market by the 1690s. The market was particularly fragmented in the many small states of Germany in the eighteenth century. Schmidt (1991) 263.

²⁴⁵ Reher (1990) 155. Also Simpson (1995) 80ff. Phillips (1979) 115 confirms the economic isolation of inland Spain: Ciudad Real 'was too far from the coasts and its products were mostly bulky agricultural commodities and cheap manufactured goods that could not bear the high costs of long-distance land transport'.

CHAPTER 5

Rome and the corn provinces

INTRODUCTION

Rome used its power to control the distribution of a large part of the grain surpluses produced in the provinces. The scale on which the Roman government determined the flows of corn (and also olive oil) throughout the Empire has important implications for our understanding of trade. Wolfgang Liebeschuetz noted that the Roman government ‘organized so large a part of the distribution of the products of the empire, that there was no scope beside it for the growth of large privately run enterprises’.¹ He did so in a book on the later Roman Empire. However, one may wonder whether things had been significantly different in the early Empire. Hence, this chapter investigates the distribution of public corn to the capital and tries to assess its importance, relative to trade, in the long-distance distribution of corn in the Roman world. The role of taxes in kind to meet the government’s requirements and to supply the city of Rome (and to feed the armies) should be seen against the background of the low degree of market integration that was observed in the [previous chapter](#).

As in any developed pre-industrial economy, long-distance supply in the Roman world was only a fraction of total consumption. Despite the relative ease of transport across the Mediterranean Sea, which favoured the long-distance distribution of corn, the amounts involved in long-distance shipments of corn should not be overestimated. Braudel estimated that during the sixteenth century, the maritime grain trade in the Mediterranean region amounted to at most 8 percent of overall consumption.² The volumes involved in the long-distance flows of corn in the Roman Empire may actually have surpassed those of the sixteenth-century Mediterranean world. Nevertheless, the long-distance distribution involved only a small

¹ Liebeschuetz (1972) 88.

² Braudel (1966) 423: ‘very little in relation to everyday consumption’.

share of food production, the bulk being consumed directly by its producers, exchanged within or between households and estates, or traded within a limited range. Geographically, imports penetrated only a small part of the Roman world.

The conditions for long-distance distributions were seldom as favourable as during the early Roman Empire. Firstly, suppliers and markets were both governed by the emperor in Rome and his provincial representatives, which meant common rules, currency and measures. Secondly, Roman power ensured safe circumstances for travel and trade, while agricultural production itself profited from peaceful conditions throughout the Roman world. 'The political unification of the Mediterranean area in a huge territorial empire brought about a great reduction in transactions costs,' Lo Cascio observed.³ Thus, Roman rule benefited trade and the distribution of goods. Indeed, contemporary writers celebrated the food supply within the Roman Empire, as for instance Pliny the Younger in his praise of the emperor Trajan:

Even the heavens can never prove so kind as to enrich and favour every land alike. But he [the emperor] can banish everywhere the hardships if not the conditions of sterility, and introduce the benefits of fertility, if not fertility itself. He can so join East and West by convoys that those people who offer and those who need supplies . . . appreciate . . . having one master to serve.⁴

Late Republican and early Imperial sources indicate that grain from almost the entire Mediterranean world arrived at Rome. For instance, when discussing the differences between various kinds of wheat grown in the Roman Empire, Pliny the Elder includes among the kinds of wheat imported to Rome those from Gaul, the Chersonese, Sicily, Sardinia, Spain, Egypt and Africa.⁵ The supply of the city of Rome and of the other metropolises of the Roman Empire obviously depended on large-scale, long-distance provisioning. The estimated one million inhabitants of the capital created the need for supply channels that would guarantee adequate and timely shipments, despite the vagaries of production and the weaknesses of the grain markets. Most cities in the Roman Empire at least occasionally required supply from beyond their hinterland, and largely relied on the market to fulfil these needs. The volumes and distances involved in the overseas distribution of corn in the Roman world may indeed have been unsurpassed in the Mediterranean region until the seventeenth or eighteenth century.

3 Lo Cascio (2000) 78.

4 Pliny, *Pan.* 32.

5 Pliny, *Hist. nat.* 18.66ff.

While M.I. Finley and others stressed the importance of governmental control ('command economy'), many scholars have recently taken the opposite stance and have pointed to the scale of private enterprise. Even if there was redistribution on the basis of Rome's political power, it is argued that this redistribution was effected by market institutions and thus functioned within the limits of the market.⁶ It will be an important point of the latter part of this chapter to see if this reasoning is valid concerning the grain supply of Rome. Concerning the various flows of corn within the Empire, Sicily and Egypt are important cases in point: both provinces sent large amounts of corn to external consumers in Rome and the armies. The Roman province of Sicily was always associated with grain in the eyes of the Romans, as for example indicated by the early imperial coinage bearing the name SICILIA and featuring ears of corn.⁷ The role of Sicilian or Egyptian grain is usually seen in the light of commerce and private trade. R.J.A. Wilson, for instance, observed on imperial Sicily that 'the island's continued importance as a major grain supplier was the cornerstone of Sicilian prosperity just as much then as it had been during the Republic.' Moreover: 'the continued long-term contribution of Sicilian corn on a large scale to the *markets* of the Empire is not in doubt' [my italics].⁸ Likewise, H.W. Pleket links the distribution of Egyptian grain to large urban markets that offered a boost to Egypt's wheat production.⁹ I do not deny the existence of large urban markets, such as in Ephesus and Antioch, but there is no evidence from imperial times of commercial exports from Egypt that supplied these markets. Nevertheless, P. Mayerson notes that wheat always had been the prime source of Egypt's export market.¹⁰ Finally, W.V. Harris explained the prosperity of Alexandria and Carthage partly by the large amounts of grain that Rome *purchased* in Egypt and Africa.¹¹ It should be noted, however, that Sicily and Egypt were tithe-paying provinces, and that the emphasis on the market may be beside the mark. The question is whether the market played any role in the large-scale distribution of Sicily's and Egypt's grain to outside consumers. The final section of this chapter will deal with the 'two-tier system' that sustained the city of Rome.

6 Lo Cascio (2000) 83.

7 Clemente (1988) 117.

8 Wilson (1990) 189. Also (2000) 160.

9 Pleket (1990) 81.

10 Mayerson (1997) 201.

11 Harris (2000) 731.

SICILY

The estates of the Roman people

In the eyes of Cicero, corn made some of the provinces especially important to Rome. Cicero simply refers to these provinces as the 'corn-provinces' – the *provinciae frumentariae*. In the oration *De domo sua*, which was delivered in September 57 BC, Cicero mentions the *provinciae frumentariae* twice: once as the provinces that during a shortage in Rome could not send corn (as they usually did, it is implied), because the traders had sold it elsewhere or kept it under lock and key.¹² In a second passage, Cicero accuses Clodius of devising a law that would hand over all private and public corn, all *provinciae frumentariae*, all contractors and all granaries to one of his henchmen.¹³ Cicero does not tell us which particular provinces he had in mind, but in the light of what is known about the main suppliers of grain to Rome during the first half of the first century BC, it is likely that he refers mainly to Sicily, Sardinia and Africa. In a letter to Atticus, dated to the turbulent and uncertain first days following the outbreak of civil war in 49 BC, Cicero refers again to the corn-provinces. He objects to the strategy devised by Pompey and the *optimates*, who had decided to leave Italy to Caesar and to overwhelm him by taking control of the rest of the empire. In particular, he condemns their decision – and these were no rumours, he writes, he had heard this with his own ears! – to occupy the *provinciae frumentariae* and to starve Italy.¹⁴ That Roman politicians of the first century BC could conceive of such a strategy is revealing in itself. At least some Romans had realised that Rome and Italy may have constituted the heart of the empire, but that the heart had need of the rest. All the separate regions had a function within the whole empire; the *provinciae frumentariae* provided Rome and the Roman state with much-needed grain.

Referring to the struggle against Carthage, Cicero mentions Sicily as the support of Rome in its food supply (. . . *rei frumentariae subsidium* . . .),¹⁵ which phrase is also to be found in the work of Livy in the same context. In his (as so often, anachronistic) account of the reorganisation of the province of Sicily after the turmoil of the Second Punic War, the consul M. Valerius reports to the senate on his return to Rome from Sicily in 210 BC that once more Sicily is an important instrument in the food

12 Cicero, *Dom.* 11.

13 Cicero, *Dom.* 25.

14 Cicero, *Att.* 9.9.2.

15 Cicero, 2 *Verr.* 2.3. Cf. Cicero, *Pro leg. Man.* 34.

supply of the Roman people in times of both war and peace (. . . *populo Romano pace ac bello fidissimum annonae subsidium*).¹⁶ In the perception of Cicero and Livy, and, one may assume, of their contemporaries, Sicily was more than just a fertile, grain-producing region.

In one of his orations against Verres, Cicero made an interesting point regarding the grain supply of Rome:

Our tributes (*vectigalia*) and our provinces constitute, in a sense, our nation's landed estates; and thus, just as you, gentlemen, gain most pleasure from such of your estates as are close to Rome, so to the nation there is something pleasant in the nearness of this province to the capital.¹⁷

In the context of this passage, Cicero emphasises just what a priceless possession Sicily was to the Roman people. He compares it to the estates of the rich inhabitants of the capital, who valued their estates the more as it was easier to bring supplies to Rome. Cicero sees Sicily as a source of supplies, but not in the sense of an important market, where Rome can buy the corn it needs, but as a 'possession' that offered what was needed.¹⁸ Although the role of trade is not denied, it becomes clear that the corn-provinces are not merely perceived as fertile regions that supply the Roman markets. In the above-mentioned letter to Atticus, Cicero agrees with a point made by Atticus concerning the corn supply: 'You are right about the grain supply, it cannot possibly be managed without the revenues (*vectigalia*).'¹⁹ The *provinciae frumentariae* were important to the Roman state, because it depended on their corn shipments, which in the eyes of the Roman statesmen largely constituted the provincial taxes they levied.

Quantifying Sicilian supplies: the evidence of Livy

The process that would eventually give Sicily, Sardinia and Africa the role of *provinciae frumentariae* within the Roman Empire started during the Second Punic War (218–201 BC). After Rome had occupied part of Sicily as a result of its victory in the First Punic War (264–241 BC), and a few years later had annexed Sardinia (and Corsica), both provinces paid a

¹⁶ Livy 27.5.5.

¹⁷ Cicero, 2 *Verr.* 2.7.

¹⁸ One is reminded of the following anecdote about Tiberius: 'When Aemilius Rectus once sent him from Egypt, which he was governing, more money than was stipulated, he sent back to him the message: "I want my sheep shorn, not skinned"' (Cassius Dio 57.10.5). See also Sharp (1999b) 213.

¹⁹ Cicero, *Att.* 9.9.4.

tax-in-kind, which was, however, just sufficient to sustain the Roman troops stationed there.²⁰ The situation changed dramatically when the Second Punic War broke out, in particular when at the death of king Hiero II of Syracuse in 215 BC, who had been a loyal ally of Rome, his successor defected to the Punic side. After three years of heavy fighting, Syracuse was taken, and the rest of the island eventually conquered. Meanwhile, Rome had had to wage a serious war on many fronts, which required not only large numbers of men under arms, but also huge amounts of grain to feed them. Hence, when reorganising the province of Sicily, which now also included the former kingdom of Syracuse, the Romans paid attention to the island as a potentially valuable source of grain. They did so by introducing throughout the province a complex system of taxation-in-kind that, as the name *lex Hieronica* indicates, can largely be traced back to Hiero II of Syracuse.

Hiero II had had recourse to large amounts of tax-grain, and had employed this in channels of trade and diplomacy, which are not always easily distinguished. He offered gifts of grain to the Romans during and after the First Punic War, but on occasion, we are told, he was paid for the corn he supplied.²¹ In addition, he sent corn to alleviate shortages in Carthage and among the Greek cities under Ptolemaic rule.²² Hiero was not the only ruler who used grain in this manner. Klaus Bringmann has pointed out that Hellenistic kings usually made payments in kind rather than in money. The reason for this was that the taxation systems in Hellenistic kingdoms – like the one taken over by the Romans in Sicily – offered the rulers control over vast amounts of grain, timber, oil and the like, but relatively little money.²³ Thus, in 161/160 BC, King Eumenes II donated 280,000 *medimnoi* of wheat to Rhodes in order to pay for the tutors who taught the Rhodian children. It was left to the Rhodians to turn this vast amount of grain into money.²⁴ It is important to note that, although the grain in such cases was eventually traded (or presented as a gift to allied states), the surplus that is marketed by these channels had its origin in taxation. Hence, already during the third century BC, the

20 Discussed by Serrati (2000) 115ff.

21 Brunt (1971) 273f; Jones (1974b) 162f; Eckstein (1980) 196; Garnsey (1988) 185f; Erdkamp (1998) 96f.

22 Berve (1959) 70ff; Eckstein (1980) 196f.

23 Bringmann (2001) 205ff. Regarding the Ptolemaic kingdom, Rathbone (2000) 50 argues that by the second century BC a shift had occurred, and that the importance of monetary taxes had increased significantly. However, the overall picture seems to confirm the greater role of taxes-in-kind, in Hellenistic as well as Roman times.

24 The example, mentioned by Polybius 31.31.1–3, was taken from Bringmann (2001) 208.

instances of long-distance supply from Sicily that emerge in our sources reflect flows of corn that originated in taxes-in-kind. 'Enterprise' as such was not involved in the creation of this part of the surplus, since the producer had little choice whether to pay taxes or not. On the other hand, this made no difference on the 'demand side': it hardly mattered to the markets on which Hiero II sold his grain by what means it was brought onto the market, except for the important fact that, without the grain-tax, less grain would have been offered for sale.

Livy mentions only shipments of Sicilian tithe-corn that are explicitly meant for the Roman armies fighting the wars in the East during the first half of the second century BC. As his account of these shipments shows, a similar system had been introduced in Sardinia by the time of the war against Antiochus (191–188 BC) at the latest. Henceforth, Rome levied a tithe on both islands, consisting of one tenth of the harvest of wheat and barley (and a similar proportion of other crops²⁵), which was used to feed its armies.²⁶ Unfortunately, he mentions the tithes of Sicily and Sardinia only in those cases when a double tithe was levied, which happened three times during the war against Antiochus and once during the Third Macedonian War (171–169 BC). In each case, both Sicilian tithes were shipped to the armies fighting in the East. Part of the Sardinian tithe-corn was shipped to Rome, possibly to be distributed or sold to the urban populace, but probably to be fed to the troops stationed there or to be shipped to the armies later. As I have argued elsewhere, during the second century BC, Rome used the tithes of Sicily and Sardinia to feed the armies, fleets and garrisons that were permanently stationed in various provinces and war zones across the Mediterranean region.²⁷

The levying of a double tithe on Sicily and Sardinia during the War against Antiochus provides the most important clue that the amounts involved in the taxation-in-kind on both islands were relatively small in the period concerned. According to the estimate of Peter Brunt, the troops fighting the war in the East numbered some 50,000 men in 190 BC and 75,000 in 189 BC.²⁸ These troops received the double tithe of Sicily and a major part of the Sardinian tithe-corn as well. In addition, at least 1.3 million *modii* of wheat were shipped from Africa, and contributions were made by Pergamum, Macedon and other allies. The shipments from Africa alone were sufficient to feed 9,000 men for three years. For

²⁵ Cicero, 2 *Verr.* 3.18.

²⁶ See Erdkamp (1998) 85ff, for a more detailed discussion and further references.

²⁷ Erdkamp (1998) 88ff.

²⁸ Brunt (1971) 274; 657f.

convenience sake, we shall add another 1,000 men for the Sardinian tithe-corn and the contributions made by Rome's eastern allies. This leaves 40,000–65,000 men to consume the entire double tithe that was sent from Sicily to the army in three consecutive years. The tithe levied on Sicily was supposed to approximate to one tenth of the harvest.²⁹ In reality it was slightly less, since the contractors who gathered the tax of one tenth expected to make a profit and thus offered to Rome an amount that was below their estimate of one tenth of the coming harvest. Nevertheless, a double tithe cannot have been significantly less than 20 per cent of the harvest. In addition, part of the harvest had to be reserved as seed corn. Hence, at most 65,000 men (and possibly as few as 40,000) consumed one fifth or more of the consumable grain harvest of the entire island. Even taking into account that civilians ate less wheat than Roman soldiers, that Rome may have oversupplied its armies terribly, and that some of the Sicilian communities were exempt from the *decuma*, these figures indicate that the Sicilian harvest, excluding the seed corn, was hardly sufficient to feed 500,000 people during these years.

Unfortunately, we do not know whether the harvests in these years were exceptionally low,³⁰ nor do we know the size of the population of Sicily during the early second century BC. If the population of Sicily had been much lower than 500,000, this would have left some scope for exports. Beloch estimated that 800,000 people lived on the island during the fourth century BC, while estimates of the population of Sicily in the late Republican and Imperial period vary from 600,000 to 1,000,000.³¹ The assumption that the population in the early second century BC had been lower than 500,000 would imply an improbably high rate of decline and growth. The five years of actual fighting in Sicily during the Second Punic War are unlikely to have caused such severe population losses. Archaeology indicates that the second century BC was a time of prosperity and growth, in particular for the Sicilian cities. The conclusion seems to be inevitable that, in those years when Rome levied a double tithe on the island, little surplus – if any at all – was available for external shipments.³²

Such a levy must have put a lot of strain on the internal food market on which the populace of Sicily's cities depended. Those cities that were

29 Pritchard (1970) 354.

30 Pointed out by Clemente (1988) 110f.

31 Finley (1979) 133; Wilson (1990) 171.

32 Contra Scramuzza (1959) 240. Some may like to argue that the shipment of 600,000 *modii* of grain to Rhodes in 169 BC indicates scope for export. In that year, however, there was no second tithe levied, because Carthage and Numidia had supplied sufficient grain to sustain Rome's overseas army. See Erdkamp (1998) 93.

exempt from the tithe (seven in all) must have counted their blessings in these years. The levying of a single tithe in other years left more scope for the marketing of corn, but whether this resulted in shipments large enough to feed Rome is doubtful. Hence, the necessity for Rhodes to ask permission from Rome in 169 BC to import 600,000 *modii* of wheat from Sicily.³³ Such an amount would only have fed 20,000 people (civilians) for a year, but would have had a large impact on Sicily's food supply. Finally, a single tithe would have covered only a small part of the requirements of the Roman armies, and would certainly not have fed the city of Rome as well.

Quantifying Sicilian supplies: the evidence of Cicero

The only precise figures on the size of the tithe are provided by Cicero concerning the year 73 BC, when he summarises the provisions of the law of Terentius and Cassius concerning the purchases to be made by Verres as governor of Sicily:

There were two kinds of purchase to be carried out, the first of a tithe, the second an additional purchase to be distributed fairly among the various communities. The amount of the former was to be the same as that yielded by the original tithes; that of the latter – the requisitioned corn – was to be 800,000 *modii* of wheat each year. The price fixed was 3 sesterces a *modius* for the tithe corn and 3½ sesterces a *modius* for the requisitioned corn. Verres was therefore assigned 2,800,000 sesterces a year to pay the farmers for the requisitioned corn, and about 9,000,000 sesterces to pay for the second tithe.³⁴

Three points are important in this passage. First, the second tithe, to be purchased at 3 HS a *modius* for a total of about 9,000,000 HS, amounted to 3,000,000 *modii*. Cicero informs us that the second tithe was equal in volume to the first. The double tithe therefore amounted to 6,000,000 *modii*. In addition, 800,000 *modii* were bought for a price of 3½ HS per *modius*. Secondly, Terentius and Cassius determined the purchase of a second tithe before the size of the harvest was known. Unlike the fixed amount of 800,000, costing 2,800,000 HS, the estimate of the amount involved in the purchased second tithe could only be based on the experience of recent years – hence, the payment of ‘*about* 9,000,000 HS’. Therefore, the remarkably round figure of 9 million HS (or 3 million *modii*) does not represent the actual tithe of a particular year, but an

³³ Polybius 28.2. Cf. Rickman (1980a) 105; Casson (1984) 80; Erdkamp (1998) 93.

³⁴ Cicero, 2 *Verr.* 3.163. Cf. Pritchard (1971) 226; Rickman (1980a) 105.

average based on the contracts offered in recent years. Such an average is of even more value to us than the actual tithe of a particular year would have been, since we would not have known whether the harvest of that year had been good or bad. Thirdly, in all the lengthy Verrine orations, Cicero never felt the need to explain the purchase of a second tithe in these years. It is addressed as something obvious, indicating that by this time the responsible magistrate always purchased a second tithe, not only in these particular years. G. Rickman sees a connection between Terentius' and Cassius' law from 73 BC and the concurrent revolt of Spartacus and the troubles with the pirates.³⁵ While Cicero in general remarks on the importance of Sicily in feeding the armies and the city of Rome, he does not even hint at the troubles in Italy in relation to the corn shipments from Sicily.³⁶ Rome did not need a crisis to require large amounts of grain to supply its armies and the Roman populace.

The figure of 3,000,000 *modii* allows us to estimate the total harvest of Sicily at that time.³⁷ The tithe consisted of one tenth of the actual harvest. However, as V.M. Scramuzza pointed out, while the farmers were expected to deliver one tenth of the actual harvest, which, if necessary, was to be established on the threshing floor, the tax-farmers expected to make a profit, and thus their contracts with the governor stipulated a lower amount than they expected to gather. Scramuzza estimates a profit rate of one tenth. In other words, the 3,000,000 *modii* do not represent exactly 10 per cent of the harvest, but only some 9 per cent.³⁸ In addition, the crops of the communities that were excluded from the tithe are not included in this estimate. Assuming that these communities on average produced about as much as the tithe-paying communities, a further 4,700,000 *modii* have to be added.³⁹ These points seem to be valid.

35 Rickman (1980a) 45, 166ff. Cf. Scramuzza (1959) 256.

36 Cicero, 2 *Verr.* 3.127. Cf. 2.5; 3.73.

37 Wilson (2000) 136 claimed that we cannot trust any of the figures provided by Cicero: 'The details provided by Cicero to flesh out the general picture of Verres' corruption and insatiable greed are probably wholly unreliable.' Hence, he rejects Carcopino's calculations on this basis. I agree that Cicero distorts the picture he paints of the situation in Sicily under Verres' governorship, but the distortion will largely have consisted of his selection and presentation of figures. Many of the figures offered by Cicero were easy to check by his opponents. Is it really credible that Cicero would have falsified the figures on amounts and prices that had recently been fixed by the law of Terentius and Cassius? Confidence may also be found in Duncan-Jones' conclusion (1997) 150, 156 that Cicero's letters and speeches show little sign of numerical distortion in contrast to, for instance, non-historical Latin sources.

38 Scramuzza (1959) 256.

39 That is: the average of tithe-paying communities multiplied by the number of tax-exempt communities. Scramuzza (1959) 259; 327ff.

Therefore, the entire Sicilian crop of wheat amounted to about 38,000,000 *modii*.⁴⁰

On the basis of this figure, Scramuzza estimates that 4,700,000 *modii* were available for shipments abroad, but this estimate is somewhat inflated, primarily because his estimate of seed-corn is too low. Scramuzza awkwardly estimates the amount of seed-corn by guessing the acreage under cultivation of wheat at 790,000 *iugera*. Rejecting Cicero's sowing rate of 6 *modii* per *iugerum* as too high, he assumes a sowing rate of 5 *modii*. Nevertheless, his estimate of production still adheres to Cicero's figure of 48 *modii* per *iugerum* in the *ager Leontini*.⁴¹ Therefore, Scramuzza assumes an unlikely high seed yield of almost 10:1 for the entire island! Cicero's yield of 8:1 for a successful harvest refers to a region that he explicitly regarded as the most fertile area of the island. Many parts of the island were undoubtedly less productive, so that an average yield of 6:1 or 7:1 seems to be more realistic. Hence, some 14–17 percent had to be reserved as seed-corn, which means that about 31,500,000–32,700,000 *modii* were available for consumption. Rome extracted an amount of approximately 6,850,000 *modii* (including the double tithe, an additional purchase and the *frumentum in cellam* for the governor's staff) from Sicily, leaving about 24,650,000–25,850,000 *modii* for consumption by the population of Sicily. Much of this served to supply the domestic, urban market. Scramuzza's (in his own words, conservative) estimate of a population of 750,000 people⁴² would leave about 2,500,000 *modii* available for export. The population size is, of course, the most uncertain variable. The sources offer little ground for quantitative estimates. However, we may safely conclude that Sicily had considerably less grain to offer to overseas markets than was extracted by Rome by way of taxes and forced purchases. The fact that Rome paid for part of this grain does not make it trade: the producers had as little choice in delivering the second tithe as they had in paying the first tithe.

Cicero regularly emphasises the singular importance of Sicily in feeding the armies and the city of Rome. He remarks that an illegal bonus of

40 Accepted by Pritchard (1972) 656.

41 Scramuzza (1959) 260.

42 Scramuzza (1959) 262, 334. Accepted by Pritchard (1972) 660. On population figures, see also De Angelis (2000) 138ff. His method of estimating the population that the land could have supported is, however, much too crude. It is based on, first, an estimate of the territory of the Greek *poleis* of Sicily, secondly, mid-twentieth century figures for the proportion of agriculturally productive land and, thirdly, the assumption that 3 or 4ha were necessary to sustain a household of 5 people. His conclusion is that the Greek sector of the island (estimated to have been little less than half the island) could have sustained 1,500,000 people.

33,000 *medimnoi* (198,000 *modii*), which was given to Verres' henchman Apronius, was sufficient to feed the Roman plebs for a month. If we take this statement at face value, about 40,000 recipients could have been given their monthly ration of 5 *modii*.⁴³ This remarkably low figure of recipients – according to our sources, in 46 BC Julius Caesar was to reduce the number of recipients to 150,000⁴⁴ – would still require about 2,400,000 *modii* of wheat annually, in other words would consume slightly less than one third of Sicily's entire public corn shipments.⁴⁵ The rest will have been partly used on behalf of the Roman armies and fleets. Even if we assume that the remainder was entirely used on behalf of Rome's military needs, it would feed no more than 100,000 soldiers annually, which is less than the number of men that Rome had under arms at the time. The rising number of recipients of Rome's corn dole during the late Republic required increasing amounts of grain, and this demand would hardly diminish during the imperial period.

Using coercive means, Rome took control of a very large proportion – about 20 per cent, including forced purchases – of the entire harvest of Sicily. We may put this in perspective by comparison with Sicilian exports in the late Middle Ages. In a recent study, S.R. Epstein⁴⁶ has shown that at the end of the thirteenth century, external shipments amounted to 3.4 per cent of domestic output (that is, after subtracting seed-corn). During the next century and a half, exports on average increased to 5–8 per cent. It was only during the 1460s that exports reached 10 per cent, steadily increasing to a high point of 16–17 per cent in the period 1530–1550. Epstein emphasises that these figures represent averages; in some years, the rate of exports was indeed higher. However, 'the upper limit, an E/O [export/output ratio] of thirty three per cent, was reached only once, in 1392, when Sicily was plundered remorselessly to finance its conquest by foreign invaders.' He concludes that 'in medieval Sicily the foreign grain trade never involved a proportion greater than fifteen per cent of domestic output.'⁴⁷ However, does that mean that Sicily at that time did not play an important role as supplier of grain in the Mediterranean world? Not at all. 'At the height of the grain trade, Sicily exported twice to three times the proportion of domestic output of early modern Poland. Poland is

43 Cicero, 2 *Verr.* 3.72. Cf. Rickman (1980a) 166ff.

44 Rickman (1980a) 176.

45 That is: 2,400,000 *modii* is almost one third of 6,850,000 *modii* (= double tithe, additional purchase and the *frumentum in cellam*).

46 Epstein (1992) 270ff. See also Braudel (1966) 579ff; Davies (1983) 371ff.

47 Epstein (1992) 275.

often viewed by dependency theorists as epitomising the pre-industrial, export dependent country.⁴⁸

The coercive means employed by Rome may be held responsible for the very high percentage of wheat contributed by Sicily to outside consumers. Not only Sicily played this role, as may be clear from the following remark in Varro's preface to his second book on agriculture:

As therefore in these days practically all the heads of families have sneaked within the walls, abandoning the sickle and the plough, and would rather busy their hands in the theatre and the circus than in the grain fields and the vineyards, we hire a man to bring us from Africa and Sardinia the grain with which to fill our stomachs . . .⁴⁹

Remarkably, Sicily is not even mentioned by Varro, who chooses to emphasise the role of Sardinia and Africa. Cicero called these three regions the 'pillars' of Rome's food supply.⁵⁰ Most importantly, Varro's contractors are not so much engaged in *supplying* grain to Rome as *transporting* it. The men mentioned by Varro – and by Columella in a similar passage⁵¹ – were shipping contractors, not grain traders. It may be doubted whether the role that Sicily played in supplying Rome and its armies in the late Republic meant that it also played a large role in supplying the grain *markets* throughout the Roman world.⁵² Sicily may have prospered nevertheless, as Rome seems to have paid a good and steady price for a large proportion of the wheat it extracted, while Sicily's farmers sold some of their surplus at internal markets. Moreover, the economy of Sicily may have produced other valuable export articles that may explain Sicily's prosperity. In the later Middle Ages, Sicily not only exported grain, but also cheese and silk on a large scale. Both are compatible with extensive cereal farming; firstly, integration of arable farming with livestock farming may explain the high levels of Sicilian productivity; secondly, the textile industry depended largely on the superfluous labour in farmers' households.⁵³

48 *Ibid.* 276.

49 Varro 2.pr.3.

50 Cicero, *Pro leg. Man.* 34. Cf. Plutarch, *Pomp.* 50; Lucan, *Phars.* 3.60ff.

51 Columella 1.pr.20.

52 Therefore, the hypothesis that Sicily experienced economic decline from the late first century BC onwards, because of the increased competition from Egypt and Africa, is unfounded. See Wilson (1990) 34. It should also be pointed out that scholars nowadays doubt the once widely held belief about Sicily's role in supplying grain to the cities of Classical Greece. Rathbone (1983) 50.

53 Epstein (1992) 292ff.

TAXATION-IN-KIND

G. Rickman argued that during the late Republic and early Empire, taxes-in-kind were largely changed into monetary taxes: 'Fixed taxes in cash had taken the place of tithes in both Sicily and Asia. If there was less paying of taxes in kind than previously, except in Egypt, and yet the need in Rome for corn to eat was certainly no less than before, the important role that private corn merchants could play is obvious. They were ready to seek out corn, buy it, transport it and sell it again, on the Roman market.'⁵⁴

However, it is unlikely that the tithe system on Sicily was converted into a monetary tax. During the Principate, the supplies from Egypt and Africa undoubtedly surpassed Sicily's shipments.⁵⁵ Sicily was simply not large enough to keep playing a major role in the increasing needs of the city. However, the problem of shipping adequate amounts of corn to Rome, which in some years led to empty stores just before the beginning of the sailing season, would have made it unwise for the Roman government to ignore this conveniently nearby supplier of corn.⁵⁶ Moreover, the presence of a *curator frumenti publici* indicates that Roman officials on Sicily still controlled public grain, although it is not impossible that such an official dealt with public grain that had been acquired by other means than taxation.⁵⁷ Neither the supply of Rome nor Roman taxation during the imperial period corroborates Rickman's hypothesis. The most important tax in Asia had been a monetary tax from the start, and was therefore not 'converted' from a tax-in-kind during the late Republic.⁵⁸ Even so, the Ephesian customs law indicates that the *publicani* exported tax-grain and, hence, had been paid in kind rather than money.⁵⁹ There is evidence that the central parts of Asia Minor paid taxes-in-kind in imperial times. These taxes, which were transported to the harbours on

54 Rickman (1980a) 72. Likewise, Lo Cascio (2000) 81; Hopkins (2000) 256. Rickman's hypothesis regarding Sicily is rejected by Duncan-Jones (1990) 189, who remarks that this view is based on the false assumption that 'stipendiary' cities paid taxes in money. Cf. Rickman (1980a) 64f, where he argues that Caesar or Augustus transformed the *decuma* into a fixed *stipendium* in cash.

55 See below.

56 Tacitus, *Ann.* 12.43 informs us that no more than ten days' supplies were in store. In the late winter of AD 69 the city's granaries still had only ten days' supply left (Tacitus, *Hist.* 4.52.2). Cf. Suetonius, *Claud.* 18.2–19.1; Tacitus, *Hist.* 4.38; Gaius, *Inst.* 1.32c; Ammianus 19.10.1.

57 CIL 10.7239. Wilson (1990) 190, 172–3, 175. See also Clemente (1988) 117; Garnsey (1988) 231f, contra Rickman (1980a) 64f.

58 Plutarch, *Caes.* 48; Cassius Dio 42.6.3; Appian, *Bell. Civ.* 5.4. See Rickman (1980a) 42ff. Cf. Badian (1972) 23f, 116f; Brunt (1990) 380f; Duncan-Jones (1990) 193; Mitchell (1993) 248ff; Lintott (1993) 76; Erdkamp (1998) 111.

59 Pleket (1998) 121f.

the southern coast, were directly linked to the requirements of the armies in the East.⁶⁰ The government's choice to gather taxes either in kind or in money was determined by its various needs and by local conditions. Monetary taxes were sometimes most convenient, but there is neither evidence nor any reason to assume that the tithe system that during the Republic had operated in Sicily, Sardinia, or Spain, was converted into a monetary tax.⁶¹

During the first century BC, Rome levied a tax on agricultural produce in many provinces. In Appian's *Bellum Civile*, for instance, Brutus is made to say that Rome generally took 'a tenth of their produce by way of tax'.⁶² The actual tax rate could be higher than one tenth. We know, for instance, that in 47 BC Caesar determined the taxes to be paid by the Jews at one fourth of sown crops.⁶³ Taxes-in-kind were still in existence in the early Empire. See, for instance, the following statement by Tacitus concerning the reign of Tiberius:

... the corn tribute, the monies from indirect taxation, and other public revenues were handled by companies of public knights (. . . *frumenta et pecuniae vectigales, cetera publicorum fructuum societatibus equitum Romanorum agitantur*).⁶⁴

Tacitus distinguishes between three kinds of state income: the tribute of crops, the tribute of money and other public income. Apart from Egypt, the sources indicate the existence of regular taxes-in-kind in the imperial period in various provinces, including Africa, Mauretania, Bithynia, Phrygia, Thrace and Pannonia.⁶⁵ Hyginus, for instance, mentions taxes of one fifth and one seventh of agricultural produce: 'In some provinces, they [the landholders] pay a definite proportion of the produce, some one fifth, others one seventh; others pay cash, and this is based on an evaluation of the land.'⁶⁶ Dio Chrysostom mentions tithes that were paid by the farmers of Bithynia.⁶⁷ In AD 215/16, the emperor Caracalla

60 Mitchell (1993) I 248ff.

61 In Spain a tax-in-kind of one twentieth of agricultural production had been levied. Livy 43.2.12. On the development of taxation in Spain, see Richardson (1976) 147ff; Lintott (1993) 72. In contrast, Von Freyberg (1989) 104: the state derived most income from monetary taxes.

62 Appian, *Bell. Civ.* 2.140.

63 Josephus, *Ant. Jud.* 14.202f. The Jews were granted tax exemption in sabbatical years, that is, in the first year of a seven-year cycle. Cf. Hamel (1990) 145f.

64 Tacitus, *Ann.* 4.6.3.

65 Neesen (1980) 25f, 45ff; Von Freyberg (1989) 100ff; Duncan-Jones (1990) 187ff.

66 Hyginus 2 205L = Campbell (2000) 160f. Duncan-Jones (1990) 187f: 'though he is writing long after the time of Augustus, Hyginus gives first place to payment in kind.' In contrast: Hopkins (2000) 256.

67 Dio Chrys., *Or.* 38.27. Cf. Jones (1974b) 182.

remitted all outstanding debts in corn and money from the city of Banasa in Mauretania Tingitana. These were no ad hoc levies: the emperor expressed his expectation that their gratitude would induce the citizens of Banasa in the future to pay their 'annual taxes in corn and money' in time.⁶⁸ Taxes levied in provinces like Britannia, Pannonia and Moesia are unlikely to have been destined for Rome. During the Republic, taxation in kind had been an important means for the Roman government to meet its requirements without involving a very weak market. Little had changed in the Roman requirements on behalf of the city of Rome or the armies to cause such a radical change as a conversion of the Roman tax system.

In addition to taxes-in-kind, the imperial estates offered direct control of the agricultural production of vast stretches of land.⁶⁹ The imperial estates were originally the private possessions of Augustus and his successors, which were gradually enlarged by means of annexation from foreign enemies, confiscation and inheritance.⁷⁰ Nero not only was heir to all the possessions of the Julio-Claudian dynasty, he also acquired extensive possessions through the confiscation of the estates of such wealthy men as Seneca, whose possessions in Egypt were surpassed only by those of Nero himself. Nero also acquired extensive domains in Africa through the confiscation of the estates of six great landowners, who, according to Pliny, owned half of the province.⁷¹ Interestingly, it is claimed that Nero's *a rationibus* Claudius Etruscus held account of the harvests in senatorial provinces, which may refer to Nero's possessions in Africa.⁷² At the death of Nero, the private domains of the Julio-Claudian emperors were turned into the *patrimonium principis*, which was not so much the princeps' private property, but henceforth was attached to the now formally recognised position of the emperor. Vespasian took over the accumulated wealth of the entire Julio-Claudian house, and also the properties of Galba, Otho and Vitellius.⁷³ Although Pliny's remark on the extent of the six landowners' possessions is probably an exaggeration, it is clear that Nero's successors held extensive domains in North Africa. There is evidence of imperial estates in Africa Proconsularis, the plains surrounding Cirta in Numidia, and Sitifis in Mauretania. The papyri offer some insight into the development of imperial possessions in Egypt, but imperial estates are attested almost throughout the Empire. Worth mentioning

68 AE 1948, 109 = Freis (1994) nr. 134. Duncan-Jones (1990) 191.

69 Herz (1988) 86f; 106.

70 Thompson (1987) 558f.

71 Pliny, *Hist. nat.* 18.35.

72 Statius, *Silvae* 3.3.90. Cf. Rickman (1980a) 213f.

73 Parassoglou (1978) 26f.

are the estates in Spain, which, like those in Africa, contributed to the capital's supply of olive oil.⁷⁴

Procurators, who leased the running of individual estates to *conductores*, administered these domains as representatives of the *fiscus*. During the second century AD, the estates in North Africa that are best documented were farmed by small-scale tenants, who worked under sharecropping contracts. In addition to delivering a proportion of their harvests, the tenants were obliged to contribute labour during a fixed number of days on the estates leased by the contractors. The imperial procurators closely supervised the contractors. However, the reality was that the contractors, backed by the procurators, abused their powers, leading to complaints by the tenants to the emperor.⁷⁵ From the reign of Vespasian onwards, the imperial domains in Egypt were administered by the *ousiakos logos* (or *ratio usiaca*), and not by the *fiscus*. At the head of this department was the *procurator usiacus*.⁷⁶ Subordinate officials were responsible for the administration of the separate estates, which included the leasing of the land to individual tenants and the collection of rents.⁷⁷ Much of the income from the Egyptian domains consisted of rent in kind, in particular wheat. According to the estimation by George Parassoglou, 'the grand total of the known grain-land in the Arsinoite belonging to the *ousiakos logos* comes to little less than 10,000 *arourae*. In a normal year this would be expected to yield between 40,000 and 60,000 *artabae* of wheat in rentals.'⁷⁸ This amounts to 1,200–1,800 tons of wheat annually (sufficient to feed 6,000–9,000 people), deriving only from the known domains in the Arsinoite.

Unfortunately, it is less clear what income the emperors derived from the African domains, in other words, whether the contractors paid in cash or in kind. Dennis Kehoe assumes that the *fiscus* derived an income in kind from the imperial estates in the Bagradas Valley. Moreover, he strongly argues that the whole system was devised in order to ensure the *fiscus* a stable income of corn: 'By collecting the rent in kind (probably as a fixed payment of crops by the *conductores*), the *fiscus* gained greater control over the harvest, and so could better assure itself of an adequate

74 For a detailed analysis of the evidence for the imperial estates, other than those in the Bagradas Valley, see Kehoe (1988) 197ff. Imperial estates in Egypt: Parassoglou (1978); Rowlandson (1996) 56ff. A brief description of the kinds of evidence on imperial estates throughout the Empire is offered by Thompson (1987) 556ff.

75 Flach (1978) 476; Rickman (1980a) 111f.

76 Parassoglou (1978) 27ff. 'Both the *dioiketes* and the *usiacus* were independent heads subordinate only to the prefect, the official in charge of the entire financial administration of the province' (p. 86).

77 *Ibid.* 53ff.

78 *Ibid.* 44.

supply of food no matter how prices fluctuated on the market.⁷⁹ Interestingly, T. Flavius Macer, who was *procurator Aug. praediorum saltuum Hipponensis et Thevestini* (that is, procurator of the imperial domains in the districts of Hippo and Thevesta), had previously been installed by Trajan as *curator frumenti comparandi in annonam urbis*. Thus, he had been charged with the acquisition of grain for the benefit of the city of Rome.⁸⁰ The relationship between the two functions remains unclear. However, it runs counter to the logic of Roman administration to assume that the contractors were left with vast amounts of grain and other products and paid for their leases in cash, while at the same time procurators were buying corn on the market to fulfil Rome's needs. Hence, it seems most likely that the imperial domains in Africa and elsewhere provided the emperors with large amounts of grain, which were to be used in their own interests. Hence, Dorothy Thompson concludes that the imperial estates 'are likely to have played a significant role in supplying both the capital and other large cities with the grain they required. They might similarly serve the needs of the army.'⁸¹

Support is also offered by evidence indicating that the emperors restricted the laying out of vineyards on arable land. An Egyptian papyrus mentions a law of Hadrian, which was later confirmed by Antoninus Pius, which ruled that farmers, who had planted vines without permission on land formerly cultivated with wheat, had to remove the vines and restore the previous situation. Inscriptions from North Africa offer parallels to this measure: Hadrian allowed the planting of vines on former wheat land only if the land had remained barren for at least ten years. Such measures express the imperial interest in the production of wheat.⁸²

The state's income in kind was related to its spending on behalf of the armies and the city of Rome. Sources from the imperial period relate the corn dole to the tribute that was gathered in the Roman provinces. First, Augustus mentions the distribution of private corn in the *Res Gestae*:

From the consulship of Gnaeus and Publius Lentulus (18 BC) onwards, whenever the taxes (*vectigal*) did not suffice, I made distributions of grain and money from my own granary and patrimony, sometimes to 100,000 persons, sometimes to many more.⁸³

79 Kehoe (1988) 165.

80 CIL 8.5351 = ILS 1435. Rickman (1980a) 85f. Cf. Peña (1998) 161 on a *procurator ad olea comparanda per regionem Tripolitanam*.

81 Thompson (1987) 567. Cf. Whittaker (1983) 166; Peña (1998) 212.

82 Egypt: BGU 11.2060. Africa: CIL 8.25943; 26416. Ruffing (2001a) 267ff.

83 *Res Gest.* 18.

Two points are important. First, Augustus 'privately' owned sufficient corn to hand out distributions to a hundred thousand people or more, which amounts to at least 500,000 *modii* each month. An earlier passage in the *Res Gestae* sheds some light on the probable origin of this corn. In 23 BC he had distributed twelve 'hand-outs' of corn, which had been bought from Augustus' private means.⁸⁴ It is possible that five years later he also bought the grain that he distributed, which may reflect the fact that at this early date the imperial domains were not yet as vast as they would become during the first century AD. Secondly, it was a shortage of the tribute that necessitated Augustus' acts of generosity. Hence, the grain that was distributed to the *plebs frumentaria* normally derived from taxation.

Secondly, the *Historia Augusta* has the following note on Septimius Severus:

At his death he left a surplus of grain to the amount of seven years' tribute, or enough to distribute seventy-five thousand *modii* a day, and so much oil, indeed, that for five years there was plenty for the uses, not only of the city, but also for as much of Italy as was in need of it.⁸⁵

The same information is given twice, first at the beginning of his reign (in chapter 8), where it is mentioned that the emperor took over a grain supply that was not functioning properly; secondly, at his death (in chapter 23, see quote). The passage implies that about 27 million *modii* were distributed annually. The statement that Septimius Severus left stocks amounting to seven years of tribute is not very plausible. Not only does a reserve of seven years of tribute seem impossibly large, one can also question the usefulness of such a measure. Unlike millet, which could be kept for over five years, wheat does not hold for more than two years. Rickman rightly believes that the figure of 75,000 *modii* a day did not originate in a source referring to the reign of Septimius Severus, but pertains to the time of the writing of the *Historia Augusta*, i.e. the fourth century AD.⁸⁶ Nevertheless, the passage indicates that the corn required by Rome was reckoned in years of tribute. Either at the turn of the third century or in the fourth century AD, the consumption of Rome was directly related to taxation-in-kind.

Finally, the *Historia Augusta* has the following on the distribution of bread in Rome during the reign of Aurelian:

84 *Res Gest.* 15.

85 *H. A., Sept. Sev.* 23.2. Cf. 8.5.

86 Rickman (1980a) 234f. Cf. Herz (1988) 157; Jongman (2000b) 280.

To the loaves of bread for the city of Rome he added one ounce, which he got from the revenues (*vectigal*) from Egypt, as he himself boasts in a certain letter addressed to the prefect of the city's supply of grain (*praefectus annonae*).⁸⁷

The letter that follows describes the measures taken to increase production in Egypt and to improve the transportation of the Egyptian tribute.⁸⁸ The *Historia Augusta* is notorious for its fictitious letters, but that does not alter the fact that the increase of the distribution of bread is related to a rise in the Egyptian revenues. Previously, we are informed that Aurelian employed the revenues (*vectigal*) from Egypt, consisting of such products as glass, linen, papyrus and hemp, on behalf of the city of Rome. It is explicitly added that these were products 'on which a perpetual tax was paid in kind'.⁸⁹ Although the latter passage does not relate to grain, it confirms the use of revenues to fulfil the needs of Rome. The assumption that taxes in cash had replaced taxes-in-kind is contrary to the evidence and Roman needs.

EGYPT

While late Republican sources praise Sicily and Sardinia, together with Africa, as the main instruments in Rome's grain supply, the two islands disappear from sight at the start of Augustus' reign, their role being taken over by Egypt. For the next centuries, numerous sources refer to the supply from Egypt and Africa, but Sicily and Sardinia are missing in the accounts, only to reappear in a significant role in the supply of Rome in the late Roman period, when, owing to the control of Egyptian corn by the court in Constantinople and the loss of Africa to the Vandals, Rome was faced with increasing problems to feed its populace. In the early seventh century AD, Sicilian corn even contributed to relieve a famine in Alexandria.⁹⁰ There is no reason to assume that Sicilian shipments to Rome discontinued in the meantime. It is more likely that the sources simply fail to notice the continued role of Sicily in Rome's grain supply. Throughout the Principate, Egypt and Africa were the main suppliers of the Roman state and the city of Rome. During his campaign against Vitellius, for instance, Vespasian, who already controlled Egypt, planned to take Africa, which, according to Tacitus, would have placed the corn supply on which the capital and the armies depended in his hands.⁹¹ In a

87 *H. A., Aurel.* 47.1.

88 *Ibid.* 47.2–4.

89 *Ibid.* 45.1.

90 Clemente (1988) 118ff; Sirks (1991a) 201. Famine in Alexandria: Hollerich (1983) 198.

91 Tacitus, *Hist.* 3.8.2; 3.48. See recently Morgan (2000) 220.

complaint that is reminiscent of the passages of Varro and Columella (see above), Tacitus laments Rome's dependency on African and Egyptian grain:

And yet, Heaven knows, in the past, Italy exported supplies for the legions into remote provinces; nor is sterility the trouble now, but we cultivate Africa and Egypt by preference, and the life of the Roman nation has been staked upon cargo-boats and the vagaries of seafaring.⁹²

We have seen that Roman demands on behalf of the city of Rome and the armies during the late Republic left Sicily little scope to have an important role in the corn supply of other regions. The obvious question is, what role Egyptian surpluses were left to play during the imperial period in the Mediterranean grain trade.

Flavius Josephus and Egypt's grain

The city of Rome was undoubtedly the major destination of Egyptian tax-grain. On the basis of two statements in the *Jewish War* by Flavius Josephus, it is generally assumed that imperial Rome was largely supplied from Africa, Egypt playing an important, but secondary role. Dominic Rathbone even goes further, and states that 'the myth' of Egypt's role in supplying Rome 'derives from Augustan propaganda, and crumbles if probed – the "front line" and dominant suppliers of public grain were still Sicily and Africa.'⁹³ Unfortunately, he offers no arguments to substantiate this bold claim. 'Augustan propaganda' seems rather weak to explain both the emphasis on Egypt by such authors as Tacitus and Seneca and the total silence on the supposed main supplier Sicily.

There are good reasons to disbelieve Flavius Josephus when he implies that Africa supplied twice as much grain to Rome as Egypt. The relevant passages occur in a speech made by Herodes Agrippa to the populace of Jerusalem. The main theme of the speech, in which Herodes Agrippa tried to discourage the Jewish people from any rebellious actions against their Roman overlords, is that many peoples and regions within the Roman Empire had more reason or better opportunity to rebel against Rome than the Jews, but none of them did. Regarding the continent of Africa – in Josephus' words bounded by the Atlantic Ocean, the Pillars of Hercules and the Red Sea – he declares that:

92 Tacitus, *Ann.* 12.43.2.

93 Rathbone (1993) 86; (2000) 52. Accepted by Sharp (1998) 7.

These peoples, besides their annual produce, which feeds for eight months of the year the populace of Rome, over and above this pay tribute of all kinds and ungrudgingly devote their contributions to the service of the empire.⁹⁴

Next, he turns to Egypt, prosperous and populous:

The tribute which she yields to Rome in one month surpasses that which you pay in a year. Besides money she sends corn to feed Rome for four months.⁹⁵

Strictly speaking, Josephus' remark that Africa stretched 'up to the Red Sea' also includes Egypt, which would lead to the conclusion that the entire continent fed Rome for eight months, four of which were contributed by Egypt. However, that seems not to be intended by Josephus, who calls Africa 'distant', in contrast to 'neighbouring' Egypt.⁹⁶ His words imply that Africa contributed twice as much grain to Rome as Egypt did. The relative importance of Africa and Egypt was not the point Josephus wanted to make and it is doubtful whether he meant it to have the statistical exactness with which some modern scholars treat it.⁹⁷ It is, for instance, unlikely that no other region supplied grain to the city of Rome than Africa and Egypt.⁹⁸ Nevertheless, taken at face value, Josephus' remarks imply that Egypt's contribution to the city of Rome may be estimated at one third of the city's requirements, possibly 10–15 million *modii* annually.⁹⁹

The problem with Josephus' statements is that they run counter to all the other evidence concerning the role of Egypt in Rome's food supply. Let us start with another speech, the *Panegyricus* by Pliny the Younger, dated to AD 100. Pliny refers to a drought that caused shortages in Egypt and he offers praise to the emperor Trajan for coming to the aid of the Roman province.

94 Josephus, *Bell. Iud.* 2.383.

95 Josephus, *Bell. Iud.* 2.386. Schmidt (1989) 87 expresses some scepticism with regards to both passages, but accepts their main point (p. 94). See also Sharp (1998) 41.

96 Josephus, *Bell. Iud.* 2.384.

97 Another quantitative statement made by Josephus in the same context, which claims a total of 7.5 million people in Egypt (apart from Alexandria), has been recently rejected as doubtful and unlikely. Bagnall and Frier (1994) 53f.

98 Hence, Fulford (1987) 67 argues that the role of overseas corn has been exaggerated in our sources, which therefore have to be distrusted. Italy itself played an important role, which is, however, ignored by the ancient authors.

99 Josephus' statement is accepted by most scholars. Schmidt (1989) 94; Von Freyberg (1989) 45, 52; Sirks (1991a) 199; Gelsdorf (1994) 753; Kissel (1995) 43; Mayerson (1997) 201; Harris (2000) 717. Garnsey and Saller (1987) 84 estimate a total consumption by the city of Rome of 30 million *modii*. Some estimates are considerably higher: Rickman (1980b) 263; 40 million; Rickman (1991) 111; 60 million, including losses. Cf. Galsterer (1990) 24. Foxhall and Forbes (1982) 72 argue that Rickman's estimate of 40 million should be reduced by at least 27%.

For long it was generally believed that Rome could only be fed and maintained with Egyptian aid, so that this vain and presumptuous nation used to boast that they must still feed their conquerors, that their river and their ships ensured our plenty or our want. Now we have returned the Nile its riches, sent back the corn we received. It has had to take home the harvests it used to dispatch across the sea. Let this be a lesson to Egypt. Let her learn by experience that her business is not to allow us food but to pay a proper tribute.¹⁰⁰

The crisis in Egypt seems to have been caused by an inadequate flooding in the year 99. Interestingly, an Egyptian crisis is confirmed by a document from December of the same year that mentions a compulsory purchase price of 16 *drachmae* per *artaba*, while Roman authorities at that time normally paid about 8 *drachmae* per *artaba*.¹⁰¹ The final words in the above passage confirm that Egypt's role in the corn supply of Rome was based on the taxes that were levied by the Roman authorities. Most importantly, the picture painted by Pliny is that the city is completely dependent on Egyptian supplies: it is Egyptian corn that supplies the capital, it is Egyptian corn that is sent back. Much of it is rhetorical colouring, emphasising the prosperity of Rome, the greatness of Trajan and the subordination of the provinces. However, despite the exaggerations inherent in a eulogy, Pliny's *Panegyricus* confirms the dominance of Egypt in supplying Rome, and it contradicts Josephus' statement that Africa supplied twice as much.

Further evidence is provided by a late Roman text, the *Epitome de Caesaribus*, which was traditionally ascribed to the fourth-century author Aurelius Victor. It contains very brief biographies of Roman emperors, beginning with Augustus and ending with Theodosius I. Referring to the reign of Augustus, the *Epitome* claims that Egypt exported 20 million *modii* of wheat to the capital,¹⁰² in other words, about half or two thirds of the entire consumption of the city of Rome. The figure provided by ps.-Aurelius Victor generally meets with scepticism, since it is difficult to reconcile with Josephus' observation that Egypt only supplied one third of the capital's requirements. Scholars who combined both statements and assumed that Rome took 60 million *modii* from Africa and Egypt are rightly criticised, since such a huge amount would be sufficient to feed the city almost twice over.¹⁰³ Such ample provisioning would make little sense of the various cases of shortage in Rome during the first century AD.¹⁰⁴

100 Pliny, *Pan.* 31.

101 Rathbone (1997) 193.

102 *Epit. de Caesaribus* 1.6.

103 60 million: Casson (1980) 21f; (1984) 81. Accepted by Gelsdorf (1994) 753; Mayerson (1997) 201; Warnecke (2002) 95 n. 11. Criticised by Fulford (1987) 66f; Garnsey (1988) 231f; Schmidt (1989) 87f.

104 Rickman (1980a) 231f.

The discrepancy that thus clearly exists between, on the one hand, a supply of 20 million *modii* and on the other a supply of one third of Rome's needs is usually solved by rejecting the information given by the *Epitome*.

The scepticism with which the figure in the *Epitome* is usually treated may be unfounded. The first chapters of the book copied widely from a book by Aurelius Victor that contained short biographies of Roman emperors. Aurelius Victor and the unknown epitomator made extensive use of a full-scale, third- or fourth-century work of historiography.¹⁰⁵ In his study of the *Epitome de Caesaribus*, J. Schlumberger pointed out that the figure of 20 million *modii* is not confirmed in any parallel source, but that there is no reason to assume that the figure is fictitious. Unfortunately, the only other figure for corn shipments from Egypt is of little use as a comparison with the *Epitome*. An edict by the emperor Justinian ruled that Egypt had to sustain the capital of Constantinople at a rate of 8 million units of wheat per annum.¹⁰⁶ However, it is not clear whether this represents 8 million *modii* or *artabae*.¹⁰⁷ In the first case, it would have provided annual provisions for just a small portion of the city's populace, which would imply that only the recipients of the corn dole are meant. On the other hand, an amount of 8 million *artabae* (27 million *modii*) would have fed the entire population of Constantinople adequately. Hence, the interpretation of this figure is still a matter of debate. Moreover, it seems unclear what implications a figure for sixth-century Constantinople has for early imperial Rome. Hence, Justinian's edict cannot be used to check the figure in the *Epitome de Caesaribus*. Schlumberger concluded that the epitomator reproduced facts such as these from an unknown fourth-century source.¹⁰⁸ There is no reason to dismiss the figure provided by the *Epitome* offhand, except for the fact that it derives from an unknown source. Rather than solving the discrepancy with Josephus by rejecting the statement in the *Epitome*, we should consider dismissing the idea that Africa supplied twice as much grain to Rome as Egypt did.

One further passage against the statement of Josephus may be put forward. The *Historia Augusta* contains the following brief note on Commodus: 'He did organise an African fleet (*classis*), which would have been useful, in case the grain supply from Alexandria were delayed.'¹⁰⁹ In

105 Schlumberger (1974) 17; Körner (2002) 13ff.

106 Justinian, *Edict* 13.8.

107 Sirks (1991b) 229ff, argues that the unit was the *modius*. However, most scholars disagree: Bagnall (1985) 304; Bowman (1986) 94; McCormick (2001) 109.

108 Schlumberger (1974) 19, 72.

109 H. A., *Comm.* 17.7.

contrast to Egypt, which from the early imperial period onwards had a well-organised corn fleet that was supervised by the Roman state, the shipments from Africa seem to have been organised in a similar manner only during the reign of Commodus. Rickman relates this measure to increased uncertainties regarding the Egyptian supplies.¹¹⁰ However, a general crisis in Egypt's corn supplies is not indicated as the cause of Commodus' measure in the *Historia Augusta*. If we adhere to the brief statement in the *Historia Augusta*, the African fleet was organised to improve the shipments from Africa in case the Egyptian corn arrived too late. There had indeed been occasions in early imperial Rome when the granaries had been almost empty just before the shipping season started. Moreover, as we know from Seneca's description, the arrival of the Alexandrian fleet was a cause for public celebrations.¹¹¹ Thus, one can well understand the usefulness of an African fleet in case the Egyptian grain was delayed. However, if the grain supplies from Africa had been more important to Rome than the Egyptian shipments, it is difficult to understand why the African fleet was organised as late as the reign of Commodus. Moreover, the passage assigns the role of back-up to Africa, not to Egypt.

The uses of Egypt's grain

Finally, the conclusion that Egypt provided the largest part of the corn consumed by Rome makes the most sense of the amounts collected as tribute by the Roman authorities in Egypt. Michael Sharp has recently undertaken 'a speculative attempt to estimate the total theoretical tax yield during the early Roman period'. Estimating the entire acreage of arable land, the proportion of public and private land, and the average tax rate, he calculates that Rome could theoretically have collected an amount in the range of 9 million *artabae* (about 30 million *modii*).¹¹² As Sharp

110 See Rickman (1980b) 266f. See also Habermann (1982) 45f; Garnsey (1988) 235; Herz (1988) 140f. On the organisation of the African fleet in the late Empire, Tengström (1977) 43f; Herz (1991) 71ff; Rickman (1998) 319f.

111 Seneca, *Ep. ad Lucil.* 77.

112 The estimate by Sharp (1998) 318f is based on an assessment of all relevant factors. In contrast, Rathbone (1997) 191 succinctly mentions a figure of 'less than 5 million artabas' of tax-wheat that was exported from Egypt by the state, but it remains unclear on what estimates his low figure is based. Cf. Bowman (1986) 94, who briefly noted that the tribute in the Roman period was at least 6 million *artabae* (about 20 million *modii*). Duncan-Jones' (1994) estimate of 17.5 million *artabae* (about 60 million *modii*) seems very large instead. However, such an amount would even strengthen my argument against the credibility of Josephus' passage.

admits, Rome did not collect such a large amount each year: unflooded land was not taxed, and taxes-in-kind were sometimes converted into monetary payments.¹¹³ Although we should use this estimate carefully (it makes no claim to exactness), it offers good ground for the assumption that the overall tax-in-kind gathered in Egypt can hardly have been much less than 25 or 30 million *modii* in most years. If we adhere to Josephus' statement and assume that Egypt only provided one third of the grain supply of Rome, we have difficulty in accounting for all the Roman tax-grain.

Relatively little Egyptian tax-grain was used to feed the troops stationed in the province. At first three legions were stationed in Egypt, soon to be lowered to two legions. In addition, the crews of the Alexandrian fleet and the boats patrolling the Nile were undoubtedly fed from Egyptian tax-grain. One may add the workers in the mines and quarries in the eastern desert. Together, the requirements of the provincial troops, navy crews and workers may be estimated at 1½ million *modii* at most.¹¹⁴ The question remains whether Rome employed Egyptian grain to supply its armies in other provinces. As Rome had to sustain hundreds of thousands of troops, it might seem likely that it employed the taxes it derived from such regions as Egypt and Africa to feed those troops that were within reach of Mediterranean shipments. However, there is little evidence to support this hypothesis. First, a shortage occurring in Italy as a result of the Pannonian uprising indicates that civilians and soldiers competed for scarce grain supplies:

In spite of these reverses the remainder of the Dalmatians rose and the war kept dragging on and famine occurred in Italy, largely because of the war; therefore, Augustus sent Tiberius once more into Dalmatia.¹¹⁵

An increase in military requirements meant that fewer resources were available for urban consumers. Secondly, according to Tacitus, Vespasian saw the control of Egypt – 'the key to the corn supply' – as a means to hamper the provisioning of Vitellius' troops.¹¹⁶ However, the fact that the troops that were stationed in Italy because of the civil war were supplied from overseas channels does not point to a general reliance on the same suppliers under normal circumstances. As the newly acquired Roman

113 Bagnall (1985) 300 notes that the Roman authorities did not encourage the conversion of the land tax into monetary payments.

114 In comparison, Sharp (1998) 318 estimates a total of 250,000 *artabae* (approx. 850,000 *modii*) for soldiers, officials and workers.

115 Cassius Dio 56.12.1. Cf. Herz (1988) 68; Morgan (2000) 218.

116 Tacitus, *Hist.* 3.8.2.

provinces were increasingly capable of supplying provisions to the Roman troops, the need for grain from Egypt or Africa undoubtedly diminished.¹¹⁷ Only from the Severan era onwards do clear instances of Egyptian corn being shipped to armies abroad appear in the papyri.¹¹⁸ Until the Severan era, it is unlikely that Egypt supplied much grain to the armies in other provinces.¹¹⁹

Some tax-grain was probably used to provision the city of Alexandria, but there is no evidence to support this hypothesis, let alone quantify the amount involved.¹²⁰ There is little reason to suppose that the Egyptian towns regularly received tax-grain. Two instances from the second century AD are indeed known of public granaries supplying state-owned grain to Egyptian towns. However, as Michael Sharp observed, this is meagre evidence in view of the abundance of papyri concerning public granaries in Egypt.¹²¹

We know that the Roman authorities regularly supplied Egyptian tax-grain to cities and regions in the East. In 24 BC, for instance, King Herod the Great bought a large amount of grain from the prefect of Egypt. The account of the measures that Herod took – feeding the cities and even providing seed-corn to the neighbouring Syrians – gives the impression that the amount involved was quite large.¹²² Again, during the reign of Claudius, Queen Helena of Adiabene purchased corn in Egypt to alleviate a shortage in Judaea.¹²³ Talmudic sources confirm the occasional import of grain from Egypt. They mention Alexandria and Rome (meaning: Roman authorities in general) as the origin of the imported grain.¹²⁴ Epigraphic and other evidence mentions deliveries to the cities in the East. In AD 127, a citizen of Tralleis received permission from the emperor Hadrian to import 60,000 *modii* of corn from Egypt. Two other citizens

117 The literature on the development of agriculture in the northern provinces is vast. Roman presence was soon followed by the emergence of villas and a rapid increase in surplus production. Two factors may partly explain the speed of development: the need to feed the armies and the presence of veterans and their know-how. Stoll (2001) 309ff.

118 Kissel (1995) 105ff; Sharp (1998) 288f; Erdkamp (2002a) 62f.

119 The only exception may have been the province of Arabia, where Roman troops were probably regularly supplied from Egypt. Kissel (1995) 29f.

120 Sharp (1998) 139. We may hypothesise that the aid that was sent by Trajan to Egypt early during his reign in response to a failed flooding of the Nile (Pliny, *Pan.* 31) was sent to Alexandria rather than that it was distributed among the towns and villages of its hinterland. In this exceptional case, Alexandria may have received tax-grain from outside the province, because the regular, internal supply failed. However, this must remain pure guesswork.

121 Sharp (1998) 155. Stud.Pal. XXII 94 (AD 111); P.Tebt. II 397.14–15 (AD 153).

122 Josephus, *Ant. Jud.* 14.299ff; 15.306f; 20.51; 20.101. See Wörrle (1971) 334f; Ben David (1974) 223f; Herz (1988) 73f; Garnsey (1988) 256f.

123 See Hamel (1990) 50f on date and parallel evidence.

124 Ben-David (1974) 223.

from Tralleis are known to have acquired Egyptian corn on behalf of their city.¹²⁵ The city of Ephesus, too, honoured the emperor for giving permission to buy corn from Egypt. In the early third century AD, there was even an official in Ephesus whose responsibilities included the supply of grain from Egypt.¹²⁶ Unfortunately, the degree of permanency of this post is unknown and it may have been limited to those occasions when Ephesus acquired corn from Egypt. Also, a prominent citizen of Sparta, who had held the post of *sitones* ('corn buyer') three times, informs us that he had travelled to Egypt in order to buy grain and brought the shipment home safely.¹²⁷ Finally, coins from Tarsus indicate that this city received Egyptian grain from Caracalla and from Severus Alexander.¹²⁸

These instances make clear that the cities and peoples of the East regularly received supplies from Egypt, but it is difficult to establish the amounts involved. An issue very much related to this problem is the impact on the food supply of the cities in the East of Augustus' annexation of Egypt. Lionel Casson argued that already during the late Republic, Egypt supplied corn to Italy on a vast scale, because the diversion of the Egyptian tax-grain should otherwise have resulted in hardship in the East.¹²⁹ The main argument against this hypothesis is that the ample sources on the grain supply of Rome in the first century BC offer no mention of shipments from Egypt.¹³⁰ The answer may be twofold.¹³¹ First, there is no reason to exclude the possibility that there *was* hardship in the East when Augustus seized much of Egypt's grain. Secondly, the diversion of the flow of Egyptian grain from East to West must be put in a wider perspective. The annexation of Egypt occurred at the end of a long period of anarchy and war that had hit the East very hard. The restoration of peace in Egypt and in the East in general may have increased total agricultural production in Egypt as well as in the hinterlands of the cities

125 Iv Tralleis 77; 80 = CIG 2927; 145. Cf. Wörrle (1971) 335ff; Garnsey (1988) 256; Strubbe (1989) 102; Kobes (1999) 85; Boatwright (2000) 93.

126 Iv Ephesos VII 1,3016. See Wörrle (1971) 335; Kobes (1999) 84f.

127 SEG II.491. Quass (1993) 257.

128 Ziegler (1977) 34ff.

129 Casson (1984) 81ff. Fellmeth (1998) 309f sees Rome's claim on Egypt for its grain supply as the main cause of supply problems in the cities in Asia Minor.

130 There is also no clear evidence for the previous period. Diplomatic contacts in 273 BC, an emergency request during the Hannibalic War and a 'gift' of grain to Roman troops in Greece during the Third Macedonian War are not even an indication, let alone proof, of an Egyptian grain supply to Rome.

131 The following summarises Garnsey and Saller (1987) 98ff. Rathbone (1983) 52f argues that Egyptian exports to Greece only 'represented a slight surplus on the grain market in the Eastern Mediterranean'.

of the East, thus compensating for the loss of corn to Rome. Moreover, the past decades of civil war may well have resulted in population decline in the East, reducing the number of consumers in the eastern cities. Finally, Rome did not take all of Egypt's grain. As we have seen, the cities in the East were regularly offered a share in Egypt's tax-grain. However, it is unlikely that this amounted to more than a relatively small share in Egypt's tax-grain.

The improbability of annual distributions of Egyptian grain on a large scale is indicated by the answer of an unknown Roman emperor to a request from Ephesus during the second century AD. The inscription promises grain to this city, but only if the Egyptian harvest turns out to be bountiful:

It is clear that you will make prudent use of this agreement, bearing in mind the necessity that first the imperial city should have a bounteous supply of wheat procured and assembled for its market, and then the other cities may also receive provisions in plenty. If, as we pray, the Nile provides us with a flood of the customary level and a bountiful harvest of wheat is produced among the Egyptians, then you will be among the first after the homeland.¹³²

The emperor's answer shows that the Egyptian harvest is of the utmost importance for the grain supply of the capital. The cities could buy Egyptian wheat only when the needs of the capital had been taken care of. Although the wheat was 'bought', a free market was not involved, as is shown by the remark that Ephesus would be 'among the first' to receive permission to buy Egyptian grain. As in the case of Tralleis, which city proudly mentioned the involvement of Hadrian in granting permission to purchase corn, the 'public' nature of the wheat collected in Egypt is reflected in its distribution on the basis of the political status of the communities involved and their relations to the imperial power.¹³³ The assurance that Ephesus would be among the first communities to receive permission to import Egyptian grain indicates that there were communities that regularly needed such imports. At the same time, the entire process also shows that such communities could not count on Rome's permission annually.

132 Quoted from Garnsey (1988) 255. See for text and commentary, Wörrle (1971) 325ff. Casson (1980) 23f concludes that normally the corn was freely sold on the market, except when the Egyptian harvest had failed. See also Ziegler (1977) 31f; Strubbe (1989) 107f; Kobes (1999) 83f.

133 In contrast to Herz (1988) 73, who concludes from these instances the existence of a private export trade.

We may conclude that, as far as the sources indicate, Rome was the main destination of Egypt's tax-grain. If Egypt only supplied one third of the capital's needs, we cannot account for all the tax-grain supplied by Egypt's farmers.¹³⁴ Little grain was consumed by the troops in Egypt, and, until the Severan era, overseas armies received Egyptian supplies only during military crises. Alexandria probably consumed part of the Egyptian tax-grain, but there is no evidence to substantiate this claim. Shipments to the cities of the East cannot explain the difference, since the shortages regularly threatening Rome when the Egyptian contribution fell short of expectations are hard to explain if each year half of Egypt's tribute was spent on provincial cities.¹³⁵ The fact that the government regularly found it necessary to acquire additional grain by means of compulsory purchases strengthens this point. It indicates that the amount of tax-grain acquired in Egypt did not greatly exceed the level of requirements. Despite Josephus stating the opposite, Egypt contributed the largest part of the grain required by Rome. Support is offered by the impression emerging from the sources of Rome's dependency on Egyptian wheat. Rickman's explanation that Egypt looms so large in the sources because of the fascination with which Egypt was always held is a case of special pleading.¹³⁶ Moreover, it does not seem accidental that, for instance, three out of four Trajanic *praefecti annonae* went on to become *praefectus Aegypti*.¹³⁷ In sum, only a small proportion of the tax-grain collected in Egypt was consumed by the troops and naval crews, the largest part was shipped to the capital, and only in good years did Rome have Egyptian wheat to offer to the cities of the East.

Egypt undoubtedly played its important role in the corn supply of Rome on the basis of the taxation-in-kind levied by the authorities in the province.¹³⁸ Unlike in the case of Sicily and Sardinia, however, the Egyptian land tax consisted of a fixed amount of wheat per unit of land, and therefore it did not fluctuate in accordance with the harvest. The risk of a bad harvest was thus entirely born by the farmers. However, the special circumstances of Egypt's irrigation farming, which was less

134 Hence, it is also unlikely that the Egyptian tax-corn was largely surplus to Rome's requirements, as has been proposed by Fulford (1987) 70. However, Sharp (1998) 318 estimates the annual requirement of the Roman government of Egyptian wheat to have been no more than 5 million *artabae* (almost 17 million *modii*).

135 According to Seneca, *Brev. vit.* 18.5, only seven or eight days' supply of grain was left in store when Caligula died, while Tacitus, *Ann.* 12.43 claims that in AD 52 only fifteen days' supply was left. Cf. Schmidt (1989) 92.

136 Rickman (1980a) 67ff.

137 Herz (1988) 117.

138 On tax collection in Egypt, see Lewis (1993); Sharp (1999b).

susceptible to the vagaries of the weather, allowed such a system to work without causing problems in bad years. Sowing time was after the flood of the Nile, each year allowing farmers to adjust their cropping strategies to the rise of the Nile.¹³⁹ Moreover, whenever the Nile failed to flood their land, farmers could claim tax exemption for the unflooded lands.

The tax rate varied considerably for the various categories of land. Most private land was taxed at 1 *artaba* per *aroura*, but tax rates on private land of 1¼, 1½ or 2 *artabae* per *aroura* are also known.¹⁴⁰ The tax on public land varied from 2 to 7 *artabae* of wheat per *aroura*, but on the land of imperial estates that was rented out to individual farmers, the rate was generally higher. Most of the known cases, however, are between 3½ and 4½ *artabae* per *aroura*. Thus, the burden on the farmers cultivating public land was considerably higher than on farmers working private land. The rates of rent in private tenancy, however, were usually higher still.¹⁴¹ Sharecroppers had to hand over to their landlord between one third and two thirds of their harvest.¹⁴²

When compared to yields obtained in cereal farming in Egypt, the tax burden on the land seems not to have been excessive, although one has to realise that various monetary taxes had to be paid as well.¹⁴³ The sowing rate normally was 1 *artaba* per *aroura*. With a yield of between 10:1 and 20:1, one *artaba* is about 5–10 per cent of the crop.¹⁴⁴ Hence, the wheat tax on private land was about 10 per cent or even less, on public land it was usually up to 30 or 40 per cent.¹⁴⁵ In addition to regular taxes, Rome sometimes acquired grain by way of enforced purchases. These purchases were indeed paid for, but at a price that was usually below market level. These acquisitions by the Roman state left little choice to the ‘sellers’, thus effectively taking control of part of the farmer’s produce as if it were a tax-in-kind. However, the amounts involved in these transactions seem to

139 Sharp (1998) 117.

140 Rowlandson (1987) 284, 288; (1996) 47, 54; Sharp (1998) 28.

141 Rathbone (1993) 84; Rowlandson (1996) 71ff. Cf. Sharp (1998) 67, who notes: ‘lower rents were charged on public land than in leases of private land, so that we might expect the former to have been less productive overall.’ However, the explanation should rather be sought in the investment of landlords in the land they leased out. Landlords were obliged by law to take care of permanent infrastructure, while tenants paid the direct costs of cultivation. (See chapter two.) However, one may assume that the state invested little capital in public land in comparison with the investments made by landowners. The state’s share in the costs of exploitation seems to have been limited to the loan of seed-corn in some cases. This difference is reflected in the lower rents on public land.

142 Rowlandson (1996) 248. On tenancy in Egypt in general, see also Sharp (1998) 66ff.

143 Cf. Bagnall (1985) 299ff.

144 See chapter one.

145 Bowman (1986) 77; Rowlandson (1996) 247.

have been limited.¹⁴⁶ In general, we may conclude that during the first centuries AD the overall tax rate in Egypt was probably somewhat less than 20 per cent of the harvest.

If Rome took about 10 per cent of the crop produced on private land and about 30–40 per cent of the crop grown on public land, it left part of the surplus of Egyptian farmers in the hands of the peasants and landowners. Of course, there was a considerable internal market to supply in Egypt: the inhabitants of the numerous towns and cities in Egypt were largely dependent on the grain market. In particular, one would like to know how much grain was sold to the population of Alexandria, or was acquired by other means, for instance, collected as rent by the large landowners among the Alexandrian elite, who held estates in Egypt and collected vast amounts of rent from their tenants. The question also remains how much grain was left – after paying taxes to Rome and supplying the internal market – to sell on overseas markets. Unfortunately, the papyri provide ample evidence concerning the grain trade inside Egypt, but shed little light on the private export of corn to other parts of the Roman Empire. Hence, Richard Alston warns us that ‘we should not envisage a high percentage of agricultural products being exported on the basis of the available evidence.’¹⁴⁷ Interestingly, following the Arab conquest of Egypt, ‘there was no export market to absorb the 130,000 tons of grain that had been gathered and shipped annually to Rome or Constantinople.’¹⁴⁸ In consequence, during the Middle Ages Egyptian farmers paid much less attention to wheat cultivation and turned to flax as the main export crop.¹⁴⁹ In short, the large grain flow emanating from Egypt in Roman and Byzantine times had been based on taxation. When the taxation stopped, so did the flow of grain.

THE CITY OF ROME: THE ‘TWO-TIER SYSTEM’

At the start of this chapter, we saw that Pliny the Younger praised the emperor Trajan for his role in the food supply of the peoples within the Roman Empire. It was not within the power of the emperor to abolish

146 The material on such purchases in Egypt for the army and other purposes has been gathered and discussed by Duncan-Jones (1976) 241–62. Duncan-Jones observes (p. 248) that the papyri do not seem to distinguish between *frumentum emptum* and *frumentum imperatum*. See also Sharp (1998) 315.

147 Alston (1998) 183.

148 Mayerson (1997) 203. His estimate of shipments – 20,000,000 *artabae* or 135,000 tons – adheres to Casson’s mistaken conclusion, but that does not alter the point.

149 Mayerson (1997) 203ff; Udovitch (1999) 269ff.

sterility of the soil, Pliny remarked, but Trajan had abolished its gravest consequences by directing flows of corn from regions experiencing abundance to those in need. Trajan's accomplishments concerning Rome consisted, according to Pliny, of an abundant supply of grain and of rich stores, which were, moreover, brought voluntarily by Rome's allies and paid for by the Roman government. Clearly, it is the city of Rome that is central to Pliny's concerns. He praises Trajan's assistance to Egypt when an inadequate flooding caused a famine in that province in AD 99, but he seems to attach more importance to the fact that the boastful Egyptians had learned a lesson in modesty than to the provincials' worthiness of imperial aid. Indeed, the provinces may call themselves lucky to have an emperor, who, in the words of Pliny, 'could switch earth's bounty here and there, as occasion and necessity require, bringing aid and nourishment to a nation across the sea as if its people were numbered among the populace of Rome.'¹⁵⁰ Pliny's words imply the primacy of Rome, which was explicitly mentioned in the grant to Ephesus. Trajan's aid to Egypt is remarkable, Pliny says, because it treats provincials as if they were part of the Roman populace. Rome remained a special case, and the degree to which Roman authorities intervened in the food supply of the capital found no parallel in the Empire until Constantine created a second capital in Constantinople.

Emperors and popes

In his voluminous and scholarly study of the food supply of early modern Rome, Volker Reinhardt states that the period between roughly 1550 and 1800 was characterised by 'the more or less intensive, often desperate attempts to create means that would ensure the survival of the poorer sections of society. In the larger cities, more than half of the populace was threatened, generally up to three quarters and occasionally more. Even if one could not remove the constant threat of hunger, one could ease the rhythm of hunger and dearth.'¹⁵¹ The parallel between early modern and ancient Rome should not be stretched too far. While the population of imperial Rome may very well have numbered one million inhabitants,

¹⁵⁰ Pliny, *Pan.* 32.

¹⁵¹ Reinhardt (1991) 1: '... durch mehr oder weniger intensive, nicht selten verzweifelte Versuche ... Strukturen für das Überleben der einkommensschwächeren Bevölkerungsschichten ... auszuarbeiten. Denn bedroht waren in den grösseren Städten von den Bewohnern mehr als die Hälfte, meist bis zu drei Vierteln und gelegentlich darüber; und vermochte man das Damoklesschwert schon nicht zu entfernen, so konnte und musste man doch daran gehen, den Rhythmus von Teuerung und Getreideknappheit etwas gemächlicher zu gestalten.'

early modern Rome grew from over 100,000 inhabitants in 1550 to less than 200,000 at the end of the eighteenth century. Moreover, while imperial Rome had recourse to an empire that encompassed all the grain-producing lands of the Mediterranean area, papal Rome had to rely largely on the resources of its immediate hinterland in central Italy. The authorities in both periods succeeded in avoiding mass starvation in their city, but, despite the fact that the papal officials took over the title *cura annonae* from their imperial predecessors, the means they employed were inevitably different.¹⁵²

Reinhardt's observations regarding living conditions apply to ancient as well as early modern Rome. Tacitus, for instance, repeatedly observes that the food supply was the most pressing concern of the Roman populace. During the early years of Tiberius' reign, the plebs suffered from high prices, but, Tacitus notes, this was no fault of the emperor, who did his best to compensate for harvest failures and accidents at sea.¹⁵³ Not surprisingly, Velleius Paterculus – loyal officer and admirer of Tiberius that he was – states the opposite and remarks that under Tiberius prices in Rome were low.¹⁵⁴ The price of food was of great concern (*praecipua cura*) to the plebs, Tacitus informs us, when he says that the Roman populace rejoiced at Nero's decision to stay in the capital, because they feared supply problems in his absence.¹⁵⁵ Tacitus offers his most important insight, however, regarding events during the Civil War in AD 68 and 69, when a false rumour was spread that the governor of Africa was holding back the grain shipments that were meant for Rome.

Since the grain ships for Rome were now detained by the severity of the winter, the common people at Rome, being accustomed to buy their food day by day and having no interest in public affairs save the grain supply, believed in their fear that the ports were closed and the convoys of grain held back.¹⁵⁶

In Tacitus' view, the price level and the plebs' anxiety concerning the food supply were indissolubly connected. The masses of Rome were particularly vulnerable to sudden price rises, Tacitus notes, because they saw to their sustenance on a day-to-day basis.¹⁵⁷

152 Municipal grain officials were common in medieval Italy. Peyer (1950) 152ff. On the title *annona*, Revel (1979) 49 n. 1.

153 Tacitus, *Ann.* 4.6.4.

154 Velleius 2.126.3.

155 Tacitus, *Ann.* 15.36.4.

156 Tacitus, *Hist.* 4.38. Cf. Procopius, *Bella* 5.25.11: 'Since they were all men who worked with their hands, and all they had was what they got from day to day.'

157 Prell (1997) 171ff offers some estimates of the cost of living in Rome. Cf. Cherry (1993) 439ff on late Republican Rome; Garnsey (1991) 79ff.

However, as Reinhardt observes regarding papal Rome, price stability of grain or bread was incompatible with the laws of the international market. Hence, the liberalisation of the Roman supply system was out of the question before AD 1800.¹⁵⁸ This offers a remarkable contrast to the hypothesis of Evelyn Höbenreich regarding ancient Rome, who claims that the governmental organisation of the supply sector even during the Principate was limited to intervention at times of crises, and that the market, which was dominated by private trade, was in large part left without public protection against its structural fluctuations.¹⁵⁹ Of course, neither the desirability of price stability nor Reinhardt's observations on early modern Rome can disprove Höbenreich's hypothesis regarding ancient Rome. Thus, the question remains whether the food supply of ancient Rome was indeed largely left to the forces of the market. The purpose of this section is to show that the liberal view of the ancient Roman grain market is wrong. First, public channels contributed more grain than private enterprise to the provisioning of the city of Rome.¹⁶⁰ Secondly, the grain market in Rome functioned in a strictly regulated environment. Two main kinds of intervention can be distinguished: the corn dole, and the transportation and storage of public grain. The stimulation of market supply of grain, however, is not attested, although the opposite is often claimed in modern literature.

Annona publica

The corn dole has been treated extensively in past decades, and I want to limit my discussion to a few observations. The *frumentationes* originated in C. Gracchus' famous grain law of 123 BC, which regulated the increasing tendency of individual magistrates to employ public grain on their own initiative for distribution among the Roman populace. This practice

158 Reinhardt (1991) 142: 'Preisstabilität, sei es bei Getreide, sei es bei Brot . . . war mit den Gesetzen des internationalen Marktes nicht vereinbar.'

159 Höbenreich (1997) 31: '... dass die öffentliche Organisation des Bedarfssektors . . . selbst noch im Prinzipat stets mehr ein Eingreifen in Notsituationen geblieben ist und der von privater Hand dominierte Markt grossteils ohne obrigkeitliche Protektion seinen strukturellen Schwankungen ausgesetzt war.'

160 Contra Harris (2000) 717: 'Most of the grain which was imported in Rome was not the government's at all but the object of private commerce.' Likewise, Sirks (1991a) 13 and elsewhere. Temin (2001) 177: 'The bulk of grain imports . . . must have been privately owned,' since the Roman government did not have 'the requisite large bureaucratic administration' to sustain Rome by redistributive channels. Similar, Habermann (1982) 51. Höbenreich (1997) 325 mentions a figure of about 30 % for the share of public grain in the provisioning of Rome. Jongman (2000b) 272ff argues that reality was in between both extremes.

was an unintended side effect of the acquisition of grain – largely by means of taxation – on behalf of the Roman armies. From about the mid-second century BC, distributions of cheap grain became more frequent, as politicians came to recognise it as an opportunity to gain popularity, while the populace increasingly expected such bonuses. Gracchus turned into a structural law what had been individual politicians' measures.¹⁶¹ Neither food crises nor poverty were at the basis of the Roman corn dole. Even a senator was entitled to a share in the distributions. The grain was at first distributed at a fixed amount for a moderate price, which surely helped to stabilise prices in Rome. The number of recipients was increased in 63/62 BC on the initiative of Cato the Younger.¹⁶² The bonus to the people was enlarged further when P. Clodius introduced free distributions in 58 BC. Both Cato's widening of the group of recipients and Clodius' introduction of free distributions were politically motivated moves that had little to do with the conditions of the grain market. The *frumentationes* remained a privilege in later times. The recipients were entered on a list that was regularly revised.¹⁶³ In the first century AD, being on this list provided a certain status.¹⁶⁴ Nevertheless, the group that profited from the corn dole was large. According to our sources, Caesar reduced the number of recipients to 150,000, while a number of 200,000 is attested for the reign of Augustus.¹⁶⁵ Unfortunately, we lack almost any quantitative evidence on the recipients in later times, although the corn dole remained in existence until late antiquity and was even widened during the third century AD to include olive oil, wine and pork.

Are we to assume that the number of recipients grew at some point after the reign of Augustus? Actually, there is one passage that may suggest such an increase. According to the *Historia Augusta*, Septimius Severus improved the grain supply of Rome: 'At his death he left a surplus of grain to the amount of seven years' tribute, or enough to distribute 75,000 *modii* a day.'¹⁶⁶ If 75,000 *modii* were handed out each day, this implies the distribution of 2,250,000 *modii* of grain during a month of 30 days. Since rations consisted of 5 *modii* per month, this means that the author

161 In more detail, Erdkamp (2000). See also Garnsey and Rathbone (1985) 20–5.

162 Plutarch, *Cato Min.* 26.1; *Mor.* 818d. See also Garnsey (1988) 211ff.

163 Rickman (1980a) 188ff.

164 Prell (1997) 279ff, who denies that the recipients of the *frumentationes* can be equated with the poor. Alföldy (1984) 116 is surely wrong when he uses the term 'Lumpenproletariat'.

165 Suetonius, *Caes.* 41.3; Cassius Dio 55.10.1; *Res Gest.* 15.

166 *H. A., Sept. Sev.* 23.2.

reckoned with 450,000 recipients.¹⁶⁷ Scholars agree that the passage reflects the conditions of the author's own time,¹⁶⁸ when bread was issued daily to the Roman populace, unlike the monthly distributions of wheat during the early imperial *frumentationes*. However, the distribution of bread was still to a limited number of recipients. The *Codex Theodosianus* attests that there were 120,000 recipients of pork in AD 419 and A.H.M. Jones has plausibly argued that those eligible for the issue of pork were the same as those eligible for bread.¹⁶⁹ We may conclude that the passage in the *Historia Augusta* is not only unreliable, it is also of limited relevance to the first or second century AD. Hence, there is no reason to assume that the number of recipients was raised during the early Empire (although it cannot definitely be ruled out either).¹⁷⁰

The corn dole obviously did not cover the food requirements of the entire population of the city. The monthly issue of five *modii* of wheat was more than adequate for the average adult male, probably sufficient for one and a half or two persons.¹⁷¹ If the assumption is correct that there were about 200,000 recipients, the corn dole was sufficient to feed between 300,000 and 400,000 people, possibly more than one third of the Roman populace.¹⁷² Although the corn dole was restricted to a privileged section of the capital's populace, it improved the conditions for the entire population. The corn dole was at least once deliberately used to manipulate the market during a shortage in Rome. When the city was struck by a serious dearth in AD 6, 'Augustus, to be sure, gave free of cost to those who were receiving doles of grain as much again in every case

167 In contrast, Sirks (1991b) 221: '75,000 modii per day is the quantity which could have been distributed had the canon for seven years been distributed in one single year.' Why this assumption? Hence, according to Sirks the actual canon was sufficient for only one seventh of 450,000, i.e. 65,000 recipients.

168 Rickman (1980a) 234; Herz (1988) 157.

169 Jones (1964) II 696. Accepted by Tengström (1974) 85; Rickman (1980a) 198; Peña (1998) 155. Rejected by Sirks (1991b) 224.

170 Aldrete and Mattingly (1999) 178 state that 'there were some additions and some growth' of the number of recipients, although the number never exceeded 250,000. Cf. Rowland Jr. (1976) 71; Garnsey (1988) 236ff.

171 Cf. Foxhall and Forbes (1982) 64f. Garnsey (1988) 212: 'One ration was ample for two people.' Likewise Garnsey (1991) 78; Jongman and Dekker (1989) 119; Ungern-Sternberg (1991) 24. Evidently wrong is Sirks' assumption (1991b) 216 that 5 *modii* a month was 'sufficient for only one person'. As in the case of Sirks' low estimate of the number of recipients, this assumption should be seen in relation to his hypothesis that Rome's grain supply largely relied on private commerce.

172 Cf. the figures provided by Aldrete and Mattingly (1999) 178: one quarter of the populace was eligible for free grain, which sustained 'perhaps twice that number'. Similar Jongman (2000b) 273, who also points out that 200,000 may be about the number of adult male citizens in Rome. In contrast, Sirks (1991a) 21 argues that the share of the distributions was modest.

as they were already getting.¹⁷³ In other words, Augustus doubled the issue of grain to the *plebs frumentaria*. Augustus undoubtedly counted on the ameliorating effect that the influx of a large amount of free grain would have on consumer demands and thus on the current market situation. In general, the free distribution of sufficient grain to feed about one third of the Roman populace lessened the recipients' dependency on the grain market and had a calming effect on price developments in the market. This may not have been the prime purpose of the corn dole, which was first and foremost a political measure, but the emperors were surely aware of the beneficial effect of by-passing the market for part of the city's consumption.¹⁷⁴

The corn dole is closely connected to the second element in the authorities' intervention in the grain supply of the capital: the shipment of large quantities of grain to Rome and their storage in public granaries. As we have seen, Rome levied taxes-in-kind in many provinces, including, in particular, Sicily, Africa and Egypt. The main destination of this grain was the city of Rome. Under normal circumstances, the shipments of Egyptian corn to Rome may have amounted to 20 million *modii* (or more) of wheat annually. Moreover, large quantities of tax-grain were shipped from other provinces, including Africa and Sicily. In addition to taxes-in-kind, the ever expanding imperial estates offered direct control of increasing quantities of agricultural produce. If indeed Egypt alone shipped 20 million *modii* of wheat to the capital annually, the total of public grain arriving in Rome must have exceeded this amount substantially.

The sources attest that the grain in the public granaries of Ostia and Rome was largely intended for the Roman plebs. Suetonius writes in his biography of the emperor Gaius that he would sometimes close the *horrea* and thus decree hunger to the populace (*populus*).¹⁷⁵ Seneca informs us that at one time during the reign of the same emperor, the officials in charge of the public food supply withheld from the populace the fact that only seven or eight days' supply of grain was left in the granaries.¹⁷⁶ It is unlikely that the granaries of private traders are meant, since merchants would hardly have kept the impending catastrophe quiet. The officials knew that the *horrea publica* only contained little grain, and that the city's populace depended on it for their sustenance. Most interesting is the

173 Cassius Dio 55.26.3. Cf. Herz (1988) 68.

174 Cf. Schneider (2000) 59: the market was 'teilweise ausser Kraft gesetzt'.

175 Suetonius, *Gaius* 26.5.

176 Seneca, *Brev. vit.* 18.5–6. Cf. Herz (1988) 89.

following passage from Tacitus' *Annals*: 'Nero had the grain for the populace – which had been spoilt by age – thrown into the Tiber, as proof that the corn supply was not a matter for anxiety.'¹⁷⁷ This measure seems to have been taken in the aftermath of two catastrophes that struck the supply system sustaining Rome: 200 ships had been sunk in the harbour by a storm, while 100 boats had been destroyed by fire on the Tiber. Nevertheless, Tacitus writes, the grain price was not increased. The discarded grain was meant for the plebs (*frumentum plebis*). Part of the public grain was undoubtedly regularly withdrawn from the *horrea* to be issued to the *plebs frumentaria*. However, the incident shows that the granaries did not simply contain sufficient grain to sustain the regular *frumentationes*, the volume of which was, of course, highly predictable. More grain was shipped to Rome than was needed for the corn dole. This is confirmed by even a conservative estimate of shipments to the capital. The Roman authorities shipped substantially more grain to Rome during the early Principate than the 12 million *modii* needed annually for the corn dole during the reign of Augustus.¹⁷⁸

Private enterprise and the grain supply of Rome

Did public supply channels simply replace the grain market? If this were so, why was the price of grain the chief concern of the Roman populace? It might be argued, moreover, that the Roman authorities took great care to stimulate the participation of traders and ship-owners in the supply of Rome. Regarding the privileges awarded to merchants and shippers, G. Rickman observes: 'the important role that private corn merchants could play is obvious. They were ready to seek out corn, buy it, transport it and sell it again, on the Roman market.'¹⁷⁹ More recently, Lo Cascio also

177 Tacitus, *Ann.* 15.18.2. Carney (1971) 43 concludes that Claudius' innovations became effective under Nero. Hence, during Nero's reign, huge corn reserves were built up, while granaries had been inadequately stocked under previous emperors. Kohns (1988) 120 argues that the measure must have been exceptional, since it would otherwise not have worked to impress the populace. Cf. Pliny's remark in *Pan.* 29: Under Trajan, grain is not taken from the allies only to rot in Rome's granaries. Garnsey (1991) 78 assumes that not all the grain that was handed out at the *frumentationes* was fit for consumption. On the use of spoiled grain in late ancient Rome, Tengström (1974) 70.

178 Cf. Hopkins (2000) 256: 'The Roman government's known exactions in kind far exceeded its known needs. The wheat tax from Egypt alone was twice as much as the central government needed for wheat doles to citizens at Rome and frontier soldiers, combined.'

179 Rickman (1980a) 72, cf. 143. It should be noted that Rickman argued here on the basis of his wrong assumption that taxation-in-kind was largely converted into monetary taxes, which compelled the Roman authorities to buy grain on the market.

argued that the privileges 'were no more than a stimulus to private activity conducted within a market situation'.¹⁸⁰ However, we should be careful not to identify the involvement of private enterprise in the supply system of Rome with private enterprise supplying Rome. Hence, while it is not denied that private traders did play the role described by Rickman, it is argued that the authorities were primarily interested in their participation in the conveyance of public grain.

Important in this regard is an edict of Claudius concerning the food supply of Rome, which Suetonius relates to a dearth that caused a riot during which the emperor himself was almost molested. Suetonius informs us that the dearth in Rome was the result of a run of bad harvests that had caused stores to be depleted. Problems apparently arose when insufficient supplies arrived during winter:

After this experience he resorted to every possible means to bring grain to Rome, even in the winter season. To the businessmen (*negotiatores*) he held out the certainty of profit by assuming the expense of any loss that they might suffer from storms, and offered to those who would build merchant ships large bounties (*naves mercaturae causa fabricantibus magna commoda constituit*), adapted to the condition of each.¹⁸¹

The immediate difficulty that confronted the grain officials was a lack of supply in wintertime, and this was the first problem that Claudius addressed. Rickman argued that the term *negotiatores* employed by Suetonius implies that these merchants were dealing for themselves and were not merely conveying public grain.¹⁸² However, the term *negotiator* is attested with the meaning of 'contractor' in the writings of this period. Tacitus (*Ann.* 13.51) informs us that during the reign of Nero it was decided that ships were not considered taxable property of the *negotiatores*. The context of this measure, dealing with public contractors' abuse of power and their position regarding various imperial taxes, shows that the passage deals with *negotiatores* whose ships had been involved in the conveyance of public grain.¹⁸³ Hence, the *negotiatores* in Suetonius' passage can also be contractors. The remarks concerning wintertime losses confirm that they were ship-owners who had a contract to transport

180 Lo Cascio (2000) 83. He also states that provisioning of Rome or the armies did not by-pass the market.

181 Suetonius, *Claud.* 18.2. Cf. Sirks (1991a) 40ff; Höbenreich (1997) 76f.

182 Rickman (1980a) 72. Also Aldrete and Mattingly (1999) 186 assume that the *negotiatores* were merchants who supplied the Roman market.

183 Thus, Sirks (1991a) 69; Höbenreich (1997) 81 n. 109. Cf. Herz (1988) 102ff; Aldrete and Mattingly (1999) 186f.

public grain. Normally, the contractors in a *locatio conductio operis* carried the risk of *vis maior*, such as storm. Claudius sought to solve the problem of insufficient provisioning during winter by making good any losses if ships were sunk or damaged, and by guaranteeing payment if cargoes were lost.¹⁸⁴

Claudius' second measure in the account of Suetonius is also mentioned in the writings of the second-century jurist Gaius.

Likewise, by an edict of Claudius, Latins acquire Roman citizenship if they build a seagoing vessel of a capacity of not less than 10,000 *modii* of grain, and if that ship, or any other in its place, carries grain to Rome for six years.¹⁸⁵

Although it is beyond doubt that both authors are dealing with the same edict, they differ on crucial points regarding the purpose of the ships. While Suetonius mentions that these ships had to be built for the purpose of trade, Gaius states more precisely that the ships should be suitable for the transport of at least 10,000 *modii* of grain and had to be employed in the grain supply of Rome for six years, which implies a contract with the *annona*.¹⁸⁶ Nothing in Gaius' words indicates that the ship-owners participated in trade when supplying Rome. Undoubtedly, the jurist's view has to be preferred to Suetonius' representation of Claudius' decree. In sum, Suetonius' explanation of the context of the edict and Gaius' account of its content show that the emperor was primarily concerned with the regular transportation of adequate amounts of grain.

The *Digest* contains several rulings from later emperors that award privileges to private entrepreneurs who were involved in the food supply of Rome.¹⁸⁷ We are told that Hadrian explicitly limited 'the immunity on account of ships' to those who served the food supply of Rome (*qui annonae urbis serviunt*).¹⁸⁸ This is confirmed by a similar ruling in the *Digest* from the time of Marcus Aurelius.¹⁸⁹ It bestowed exemption from *publica munera* on owners of freighters of a capacity of 50,000 *modii* (or five ships of a capacity of 10,000 *modii*) as long as these vessels were employed in the food supply of the Roman people (*ad annonam populi Romani*). Finally, a rescript by Marcus Aurelius and Lucius Verus rules against those who have been awarded privileges under false pretenses:

184 Höbenreich (1997) 76. See also Rickman (1980a) 127; Herz (1988) 99ff; Sirks (1991a) 31ff.

185 Gaius, *Inst.* 1.32c.

186 Otherwise, Sirks (1991a) 62.

187 Cf. Sirks (1991a) 45ff.

188 Callistratus *Digest* 50.6.6(5).5.

189 Scaevola *Digest* 50.5.3. Cf. Herz (1988) 122f; Höbenreich (1997) 80f.

shippers and traders who brought grain and olive oil to the market of Rome, but who had not invested the bulk of their capital in shipping firms or in trading businesses, should be deprived of their immunities. The meaning is clarified in the introduction to the rescript (which derives from Callistratus): those who do not comply with all the necessary criteria cannot obtain the privileges awarded to ship-owners.¹⁹⁰ While this passage shows that businessmen provisioned the Roman market with grain and olive oil (which is not denied), it also shows that they were not awarded immunity of *munera* for that reason. It should be noted that the privileges awarded by these rulings, dating from Claudius to Marcus Aurelius, were limited specifically to ship-owners. If these measures were intended to stimulate the market supply of Rome, it is hard to explain why merchants were excluded who did not own ships, the more so since the legal writings are full of cases concerning traders who hired ships to transport goods. Apparently, the Roman government was interested in ships more than trade.¹⁹¹

Interestingly, the *Digest* also contains a ruling that derives from the writings of the Severan jurist Callistratus and mentions *negotiatores* apparently not in the role of contractors:

Men of business who assist the corn supply of the city (*negotiatores, qui annonam urbis adiuvant*), likewise ship-owners who serve the corn supply of the city (*item navicularii, qui annonae urbis serviunt*), obtain immunity from public *munera*, so long as they are engaged in this activity.¹⁹²

The fact that a distinction is made between *negotiatores* and *navicularii* rules out the possibility that this passage addresses *negotiatores* in their role of transport contractors. Also the verb *adiuvare*, meaning 'to assist' or 'to help', is less specific than *servire*, which in this context literally means 'serving the *annona*'. It has to remain unclear what exactly these businessmen 'who assisted the *annona*' did. Herz assumes that they assisted the *annona* by buying grain and selling it on the Roman grain market.¹⁹³ There are two problems with this proposition. First, in contrast to ship-owners who had a contract with the *annona*, the rather open nature of their duties made it difficult to check whether these traders were actively

190 Callistratus *Digest* 50.6.6(5).6.

191 This was also the prime purpose of the exception rewarded to shippers in the case of service for the *annona* (Ulpianus, *Digest* 14.1.1.18). Thus, Sirks (2002) 139. Finding enough ships to manage the transportation of corn was also a difficult task in the Later Roman Empire. The compulsory duty of corn shipment was decreed by the councillors of the time. See Liebeschuetz (1972) 165.

192 Callistratus *Digest* 50.6.6(5).3. Cf. Sirks (1991a) 47ff.

193 Herz (1988) 114.

engaged in supplying Rome. At the very least, supervision implies a very close connection to the officials of the *annona*. Accordingly, Höbenreich does not assume that they were trading for themselves and proposes instead that they represented the officials of the *annona* in the overseas acquisition of foodstuffs.¹⁹⁴ Secondly, unlike the decrees that limited privileges to the owners of ships that had a capacity of 10,000 *modii* of grain, there is nothing to indicate that the *negotiatores* in *Digest*. 50.6.6 (5).3 were involved in the supply of grain to the Roman market, and not of olive oil, wine or other kinds of food (or, indeed, both).

We may conclude that, in contrast to Rickman's assumption that the Roman authorities sought to stimulate the market supply of Rome and thus granted privileges to businessmen who bought grain and sold it on the Roman market, there is no evidence of the stimulation of private enterprise supplying Rome. While it is not denied that private entrepreneurs supplied the capital's market with grain, olive oil, wine or other kinds of food on their own account, it is shown that no proof exists that their activities were stimulated by Roman officials. Both Claudius' edict and Scaevola (*Digest* 50.5.3, from the reign of Marcus Aurelius) pertain to transport contractors. Hadrian's ruling refers to existing privileges for ship-owners in general terms. The only mention of traders in this context, occurring in Callistratus (*Digest* 50.6.6(5).3), can be interpreted in various ways. It is far from certain that these *negotiatores* traded in grain or that they traded on their own account. Hence, *Digest* 50.6.6(5).3 offers no evidence either. There were indeed traders who brought grain to the market of Rome, but the point is that the laws that we have seen above are not concerned with their activities.

In sum, we have seen, first, that sufficient grain was distributed to a privileged section of the Roman populace to feed approximately one third of the city's population. Secondly, a large volume of grain was shipped to Rome annually from Egypt, Africa and other provinces. Part of the public grain that was conveyed to Rome was distributed at the *frumentationes*, but, assuming that the number of recipients had not doubled since Augustus, much grain was normally left for other purposes. It may be pointed out that large amounts of olive oil were also shipped to Rome under supervision of officials of the *annona* long before distributions of oil were introduced.¹⁹⁵ Harvest failures, increased military demands and/or transport problems occasionally caused a dramatic reduction of the public

194 Höbenreich (1997) 82f.

195 Herz (1988) 132ff, 156ff; Aldrete and Mattingly (1999) 191f.

supply to Rome. As a result, every now and then we hear of public stores being almost depleted. Thirdly, because of the large transport capacity that was needed to ship the public grain to Rome, the authorities offered privileges to those entrepreneurs who built ships and employed them in the service of the *annona*. Fourthly, although the authorities conveyed sufficient grain to sustain a large part of the capital's population, the price of grain remained an important issue to the Roman populace. The last conclusion is important, because it shows that some market mechanism was still determining prices in Rome. Hence, despite the enormous volume of grain that was directed towards Rome by the authorities, the Roman populace was not simply fed from the public trough.

Selling the public grain

Unfortunately, when asking further questions, the available source material is even less extensive and solid than in reaching the above conclusions. Nevertheless, the sources admit a few observations.

First of all, the large influx of public grain in normal years must have resulted in fairly stable prices, which may have been a good thing for consumers, but made Rome an unattractive market. When shortages occurred, it may have been difficult to attract additional supplies from private traders. Hence, it is often argued that in times of dearth the Roman authorities offered financial incentives in order to increase market supply. A measure by Tiberius in response to a dearth that struck Rome in AD 19, which is briefly mentioned by Tacitus, is generally cited in support of this hypothesis: 'As the populace protested against the appalling dearth of corn, he fixed a definite price to be paid by the buyer, and himself guaranteed the merchant a subsidy of two sesterces a *modius*.'¹⁹⁶ The price in Rome was not normally fixed. Both elements in Tiberius' measure should be seen as ad hoc responses to a temporary crisis. Therefore, the *negotiatores* selling grain did not normally receive a subsidy. The purpose of the fixing of the price is clear: it limited the impact of the imbalance between supply and demand on the purchasing power and living conditions of the urban masses and thus reduced the destabilising effect on politics and society. Urban unrest triggered Tiberius' response. What grain there was, became available at prices that were more or less affordable to the masses. Of course, somebody had to pay for the price

¹⁹⁶ Tacitus, *Ann.* 2.87: *Saevitiam annonae incusante plebe statuit frumento pretium quod emptor penderet, binosque nummos se additurum negotiatoribus in singulos modios.*

reduction, and it would have been the sellers of grain who would have borne the cost, if Tiberius had not stepped in with a subsidy of 2 HS per *modius*. Unfortunately, Tacitus does not say at what level Tiberius fixed the grain price, nor do we know its relation to the 'normal' price level. Hence, we do not know whether the subsidy of two sesterces fully compensated the merchants for the loss of the profit they could have made.

The fact that Tiberius offered a subsidy to merchants has important implications for our understanding of the workings of the capital's grain market. According to most modern commentators, Tiberius tried to stimulate the external supply of the Roman grain market by offering a bonus as compensation for lower profits.¹⁹⁷ This hypothesis is certainly possible, but not certain. Tiberius may have intended to compensate the merchants for a measure that would otherwise be completely at their expense, because he either had the interests of these businessmen at heart or liked to show he did. Nevertheless, it follows that merchants operated in the Roman grain market who profited from high prices. Another important question is how Tiberius expected to recompense the merchants who sold grain on the Roman market during the crisis. The subsidy of 2 HS per *modius* almost certainly applied to grain that was sold to consumers and not on the 'wholesale' grain market. Such a measure implied supervision of transactions between traders and consumers. Otherwise, how to avoid subsidies for non-existent grain, or for grain that was kept in circulation among fraudulent traders? Although the subsidy was an ad hoc measure, called into being by a temporary crisis, its implementation required adequate control mechanisms. Time had surely been too short to allow the creation of the necessary administration from scratch. Hence, Tiberius' offer of a subsidy to merchants selling grain on the Roman market implies that some administrative apparatus was already available.¹⁹⁸

Confirmation is offered by one of Augustus' measures during the serious dearth of AD 6: 'Ex-consuls were appointed to have oversight over the grain and bread supplies, so that only a fixed quantity should be sold to each person.'¹⁹⁹ In addition, Augustus doubled the issue of corn to the recipients of the corn dole. Since the *frumentationes* were free and in the

197 Rickman (1980a) 72, 151f; Garnsey (1988) 230; Herz (1988) 88; Kohns (1988) 116.

198 It is clear that the office of the *annona* was responsible for more than just the *frumentationes* and the incoming tax-grain, but Tiberius' measure shows that they also had developed the necessary administrative apparatus to supervise and/or control the market.

199 Cassius Dio 55.26.2-3.

early Empire did not apply to bread, the temporary rationing of the sale of grain and bread on the capital's food market constitutes a separate measure. The same line of thought as rationing the sale of grain and bread is shown by the other measures that were taken: Augustus banished gladiators and slaves who were on sale from the city; the emperor and other officials expelled part of their retainers, and senators were permitted to leave the city.²⁰⁰ While these measures were intended to reduce the number of mouths to be fed, Augustus tried to make the most of available stores by spreading them as evenly as possible among the consumers. Hence, a rationing of the sale of grain and bread. Most important from our point of view is that the implementation of this measure implies a tight control of the consumer market. Thus, both the rationing of grain and bread in AD 6 and the subsidy of merchants in AD 19 show that Roman officials kept a tight control of the transactions between the consumers and the traders operating on the capital's grain market.

The fact that the authorities in Rome on the one hand commanded large stores of grain and on the other closely supervised the merchants operating on the capital's grain market suggests that the authorities possibly sold public grain to the merchants. This hypothesis may explain how Augustus and Tiberius expected to implement their measures. Nero's response to supply problems in Rome in AD 64 sheds further light on this matter. The great fire that struck Rome during Nero's reign brought a great deal of misery to the urban populace. The dearth that followed in the wake of the catastrophe called for emergency measures. The *epitome* of Cassius Dio's book 62 briefly notes that 'he deprived them of the free dole of grain'.²⁰¹ By itself, such a measure would make little sense. Although Tacitus does not take note of the temporary suspension of the *frumentationes*, he may clarify its point, when he mentions two other measures taken by Nero to improve the conditions of the urban masses: 'The necessities of life were brought up from Ostia and the neighbouring municipalities, and the price of grain was lowered to three sesterces.'²⁰² Hence, Nero took three measures that should be understood in their combination. First, he lowered the price of grain on the Roman market substantially. We may compare Nero's fixed price of 3 HS with the price of 6–8 HS per *modius* of wheat that is indicated by Pliny the Elder's enumeration of flour prices in Rome.²⁰³ However, setting a low price of grain on the market is useless,

200 *Ibid.* 55.26.1.

201 *Ibid.* 62.18.5.

202 Tacitus, *Ann.* 15.39.2.

203 Pliny, *Hist. nat.* 18.90. For the conversion of flour prices to wheat prices, see Duncan-Jones (1982) 345f.

unless sufficient grain is offered to meet demand. Therefore, Nero took two more measures: he brought grain from Ostia and other neighbouring towns, and he suspended the issue of free grain to part of the populace. The latter measure can only be explained if the grain that was intended for the *frumentationes* was offered to the populace in a different way – that is to say, was sold to them at the very low price of 3 HS a *modius*.²⁰⁴ In other words, at least during this crisis public grain was sold on the capital's grain market.²⁰⁵ The selling of goods to merchants by state officials is attested by a ruling in the *Digest* on produce of estates belonging to the *fiscus* that is sold to merchants. It is ruled that these merchants are not exempted from taxes on these goods.²⁰⁶ In sum: it is a plausible hypothesis that the authorities systematically sold public grain to merchants, who in turn sold it to consumers in Rome.²⁰⁷

The most direct way to intervene in the grain and bread supply of the Roman populace was to control the activities of the bakers. Most consumers in a city like Rome were dependent on millers and bakers for their bread, since they lacked the facilities to bake bread themselves.²⁰⁸ Whether people made their own dough and brought it to professionals who baked it in their ovens, as was a widespread custom in Mediterranean lands in medieval times, is unknown.²⁰⁹ In any case, home-baked bread

204 Already Van Berchem (1939) 74ff explains this measure as for the benefit of the entire populace, rather than a privileged section of it. Followed by Rickman (1980a) 187.

205 One more source may be mentioned in this context. Epictetus 1.10.10 briefly observes that petitions were regularly handed to the *praefectus annonae* for permission to export grain. One possible interpretation of this passage is that merchants received permission to export grain that was controlled by the *praefectus annonae*, i.e. they bought and sold public grain. It cannot be ruled out that Epictetus' remark refers to the grain supplies granted to cities like Ephesus and Tralleis. However, in these cases Egyptian grain was granted either by the emperor (Tralleis and Ephesus) or by the *praefectus Aegypti* (Palestine), not by the *praefectus annonae*. The large amounts of Egyptian grain that were owned by businessmen from Puteoli possibly have to be seen in such a context. According to a number of wax tablets that were found in Pompeii and date to the years AD 37–9, wealthy businessmen, who might be interpreted as large-scale dealers in grain, had lent money against the security of grain. In one case the security consisted of 7,000 *modii* of Egyptian wheat and other foodstuffs, in another of 13,000 *modii* of Alexandrian grain. However, nothing in the text suggests that the grain had been bought from the Roman authorities, either in Egypt or in Rome. Eck *et al.* (1993) no. 97, 98. Casson (1980) 26ff.

206 Paulus, *Digest* 39.4.9.8.

207 It is worth noting that during the fourth century, state olive oil was sold to the public at privately owned *mensae oleariae*. *Cod. Theod.* 14.24.1 establishes rules concerning the sale of these 'olive oil counters', which indicates that profits could be made. Hence, Peña (1998) 156 observes, they not only served the disbursing of free oil rations, but 'also functioned in some fashion as retail outlets. This presumably involved the sale of state oil.'

208 See for instance Plautus, *Asin.* 200.

209 Desportes (1999) 277. Cf. Pelizzon (2000) 126f.

was a mark of wealth and social status.²¹⁰ The bread of the rich was baked by *pistores* within their households, while the urban masses depended on the bakeries within the city. Rome numbered approximately 250 bakeries in the fourth century, and it is unlikely that the number had been significantly smaller in previous centuries.²¹¹ The government's policy towards the food supply of Rome involved a tight control of the bakeries. Already in Republican times, their activities had been supervised by the *aediles*, but during the Empire the degree of intervention and regulation increased. At the end of the first century BC, the funerary monument of the *pistor redemptor* Eurysaces attests the existence of bakers who worked under contract for the state. Unfortunately, no more details are given.²¹² It should be noted, though, that already in AD 6 Augustus rationed the sale of bread as well as grain, which implies the supervision of bakeries. The following remark of the fourth-century historian Aurelius Victor confirms the important role of bakers in the Roman policy concerning the capital's grain supply: 'He [Trajan] took great precaution for a steady bread supply (*annona*) by establishing a permanent *collegium* of bakers.'²¹³ It is agreed by most scholars that the *corpus pistorum* must have existed previous to Trajan's measure,²¹⁴ but this does not invalidate the main point that the government's control of the bakers in Rome implied the control of the consumer market.

The second-century jurist Gaius informs us furthermore that Trajan offered privileges to owners of *pistrina* who processed at least 100 *modii* per day and who exercised their trade in Rome for at least three years.²¹⁵ The Latin term *pistor* covers millers as well as bakers, which reflects the fact that in Roman times bakeries milled the corn themselves. A baker in fourth-century Antioch, for instance, owned a mill, and baked and sold his bread.²¹⁶ There are two main reasons for this: first, flour was more perishable than corn. Therefore, grain was ground as late as possible.²¹⁷ Secondly, as long as milling was powered by animal energy – in contrast

210 Cicero, *In Pisonem* 67. Cf. Cicero, *Pro Sex. Rosc. Amer.* 134; Suetonius, *Caes.* 48.

211 According to Herz (1991) 181f, the figure of 274 mentioned in our sources only refers to public bakeries.

212 Höbenreich (1997) 120 rightly points out that there is nothing to tie Eurysaces directly to the *praefectura annonae*.

213 Aurelius Victor, *Caes.* 13.5.

214 However, Sirks (1991a) 313f (with further references) disagrees.

215 Gaius, *Inst.* 1.34. Cf. Herz (1988) 110ff; Sirks (1991a) 311ff.

216 Libanius, *Or.* 29.10, 27. Liebeschuetz (1972) 52f. Höbenreich (1997) 120f misinterprets that the authorities were more interested in milling than in baking.

217 Pelizzon (2000) 123.

to windmills and watermills – there was no point in separating the mills from bakeries.²¹⁸ Trajan's privilege therefore pertained to those bakers who processed at least 100 *modii* of grain per day, which is sufficient to feed approximately 1,000 people. According to Paulus, bakers were freed from tutelage, i.e. they were freed from having to be tutors.²¹⁹ Again, the implementation of this measure implies administrative control. Peter Herz argues that control of the grain that was processed by the bakers implies that the state supplied the grain.²²⁰ In view of the discussion on the previous pages, this seems a likely suggestion.²²¹ We may note that during the late fourth century AD, the bakers received public grain.²²²

The question remains, why the Roman officials in the first or second century AD were interested in the bakers and in the supply of bread. Aurelius Victor emphasised that Trajan's founding of the *collegium pistorum* stemmed from a policy to ensure continuity in the bread supply of Rome. The distribution of bread, however, was introduced much later. The *Historia Augusta* ascribes the revision of the *frumentationes* to the emperor Aurelian. Although most scholars agree that the distribution of bread was introduced earlier, probably by Severus Alexander, the governmental intervention in the bakeries during the reign of Trajan was not motivated by the distributions to the *plebs frumentaria*. It remains likely that the distribution of bread even increased the authorities' regulation of the Roman bakeries.²²³ One of the changes related to the introduction of the distribution of bread in the third century AD is the emergence in Rome of state-owned water mills that were powered by the city's aqueducts.²²⁴

218 Already Marquardt (1886) 423 pointed out that the rise of the water mill caused the separation of the milling and baking process. See also Tengström (1974) 76f; Sirks (1991a) 307; Wacke (1992) 648. On the use of water mills in antiquity, Horden and Purcell (2000) 256; Greene (2000) 41f; Wilson (2002) 9ff. They show that assumptions about the failure in Roman times to adopt the water mill (for instance in Persson [1988] 132f) are outdated.

219 *Digest* 27.1.46. Cf. Ulpianus 3.1. Höbenreich (1997) 123ff.

220 Herz (1988) 113: 'Zusätzlich griff der Staat in diesen Sektor durch die direkte Belieferung der *pistores* mit Getreide ein, womit sich auch ohne besondere Mühe die Frage lösen lässt, wie man für ein *pistrinum* den Charakter eines *pistrinum centenarium* nachweisen konnte.' (Also p. 79.)

221 Instead, Sirks (1991a) 318 assumes that the *pistores* were forced by law to mill and bake the grain that was offered to them by the recipients of the grain dole. He only sees a marginal concern on the part of the authorities with the provision of cheap grain to the *pistores* (p. 312).

222 Tengström (1974) 70ff; Herz (1991) 180.

223 On the regulation of bakers in the late imperial period, Rickman (1980a) 205ff.

224 Bell (1994) 84f; Wilson (2002) 12ff. Comparison is made to the famous mills at Barbegal. However, these are now dated to the early-mid second century rather than the third century AD. Leveau (2001) 141f.

The system that operated in imperial Rome may be compared to that of early modern Rome. The officials of the papal *annona* acquired a large volume of grain in the Roman hinterland by means of compulsory purchases at a fixed price. Subsequently, they decided the price at which this grain was sold to the bakers. The bakers on their part had to sell their bread to the consumers at a fixed price, again decided by the *annona* officials. Hence, for that part of the grain that was supplied through the channels of the papal institution of the *annona*, no free market forces were involved, although the grain was 'bought' and 'sold'. The early modern *annona* supplied only a part – albeit a substantial part – of the grain that was consumed by the urban populace. However, the price of all the bread that was sold on the Roman market was fixed by the papal officials. In other words, the bakers had to accept a fixed price for their bread, although they had to acquire part of their grain at current market prices. During times of crisis this resulted in financial loss, since the bakers had to buy grain at a higher price than the one at which they had to sell the bread. Hence, the *annona* in papal Rome favoured large-scale bakeries, owned by businessmen who were sufficiently wealthy to be able to bear losses during times of crisis. In turn, they were allowed high profits when grain prices were low. At such times, the Roman populace, much to their dismay, had to buy relatively expensive bread, although grain was cheap. Such a system allowed the early modern Roman authorities in most years to keep the price fairly stable and to overcome the annual price cycle that governed prices anywhere else.²²⁵

Conclusions

It is a widely held view that private enterprise largely supplied and sustained Rome. Rickman and Höbenreich, for instance, argue that during the Principate the grain supply of imperial Rome was largely determined by the forces of the market. Apart from the *frumentationes*, it is argued, the state played a limited role: the authorities confined themselves to stimulating market supply and intervened more directly only in times of dearth. Against this view, the hypothesis is offered that a public system, in which private enterprise co-operated with state officials, largely sustained Rome. The presence of merchants or landowners who brought grain and other foodstuffs to Rome in order to sell their wares for

225 Reinhardt (1991) in particular 147ff; 255ff; 398ff.

a profit to consumers and retail traders is not disputed, but free trade in the empire's capital operated in the margins of a system that was characterised by public supply channels. The system incorporated the activities of the city's traders and bakers. In short, as far as grain and bread is concerned, Rome was fed from taxation in kind at least from Augustan times. This was a logical continuation from the state acquisition of public grain from the late third century BC onwards and its increasingly structural distribution to part of the populace in the second century BC. Its extension to oil, wine and pork in the later imperial period may be seen as the next logical step. Rome was not built in a day, and neither was its supply system. However, the steps that were taken in this development are often beyond the scope of our sources.

The distinction between private and public supply of Rome is reflected in the distinction between indirect and direct state intervention. Indirect intervention consists of measures that regulate the workings of the market by either stimulating or discouraging certain behaviour. It is commonly argued that the privileges that were offered to merchants show the general reliance on civilian trade for the provisioning of Rome. The fact, however, is that there is no clear evidence of the stimulation of Rome's market supply. The privileges that were offered to businessmen who 'served the *annona*' pertain to transport contractors. The sole mention in this context of *negotiatores* in a different sense from 'contractors' may refer to other foodstuffs than grain or bread and is in a phrase that is too vague to allow any certain interpretation concerning their role. Hence, there is no evidence for the encouragement of private trade supplying the grain market in Rome.

The Roman government's policy towards the grain supply of the capital relied almost exclusively on direct intervention, that is to say, on the transportation, storage and distribution of public grain. The reason for this is obvious: the possession of the corn provinces gave Rome the control of a large part of the agricultural production in the Mediterranean region. Faced with the weaknesses of the grain market in the Roman world, the most reliable way to ensure a stable and adequate supply of the Roman capital was to collect taxes-in-kind in the corn provinces and ship the grain to Rome. Of course, the officials of the *cura annonae* required the assistance of civilians who held contracts for the collection of taxes and the conveyance of tax-grain (or did so under compulsion of a *munus*). Furthermore, the *annona* partly relied on traders and bakers in Rome for processing and distribution. The fact that the Roman authorities controlled the activities of urban traders and bakers and their transactions with consumers shows a large degree of administrative supervision.

On the basis of the available evidence, we may suggest the following picture of the distribution of public grain in Rome. Part of the grain was issued monthly at the *frumentationes*, part of it was sold to traders and bakers who supplied the capital's consumer market. If we assume that the number of recipients of the corn dole was kept at the Augustan level of approximately 200,000 people, the *frumentationes* may have distributed sufficient grain to sustain about one third of the city's population. We may venture the guess that in normal years sufficient public grain arrived in the city to supply the market with at least as much grain as the *frumentationes*. In other words, public channels may have supplied the city with two thirds or more of its requirements. In addition, much of the public grain was handed out to members of the imperial household.

Although public channels were more reliable than the market, the system was not perfect. The system failed when supply problems arose as a result of harvest failures, military requirements or inadequate transport. Actually shipping 30 million *modii* of grain to Rome seems to have been the most serious problem, at least in the first century AD, which resulted in a policy of encouraging shipowners to build ships and employ them in transport contracts with the state. When harvests or shipments failed and stores in the *horrea* were inadequate to make up the difference, the authorities could not offer sufficient supplies to the traders and bakers who supplied the urban consumers. Prices rose in such times and then the *annona* had to resort to direct means to establish prices. Under normal conditions, however, the Roman authorities could guarantee a much more stable supply than the papacy in early modern Rome could. Hence, in contrast to their early modern successors in Rome, the imperial *annona* did not normally need to fix the price of grain or bread.

CHAPTER 6

Urban food supply and grain market intervention

INTRODUCTION

The authorities and prominent citizens of the Roman world had no particular respect for the market. The modern idea that everything is best left to the forces of the market is the product of the liberal revolution of the late eighteenth and early nineteenth centuries. Hence, it was neither capital nor the market that wholly determined the economic relations within society. Social hierarchies and awareness of social position pervaded every aspect of society, including the food supply. Literary texts and inscriptions constantly imply or express in paternalistic language the duty of those in power to protect and take care of the needs of their subjects. The question remains, however, how far the responsibility of the central and municipal authorities was supposed to go, even from the viewpoint of ideology. Was the duty of rulers limited to times of crisis, or was food supply a constant concern of the authorities? How far did governmental responsibility concerning food supply – ideally and really – extend?

Most modern authors are sceptical regarding the interest of the authorities in the food supply of the common people. Those instances that seem to indicate otherwise are either explained as mere symbolic expressions of governmental responsibility, or as forms of euergetism that by their nature are unrelated to the workings of the market. Hence, they assume that the role of the government and of the local elites was inefficient or limited to occasional acts of beneficence towards a privileged few. Laws that regulated the market were ‘symbols’ of the rulers’ care for their subjects; they were not designed to work, but to reflect the ruling elites’ concern for their subjects. Thus, they are mere attempts of the powerful to legitimise their power. Similarly, market intervention by the rich reflects as little care for the living conditions of the masses as the offering of public banquets or the financing of games. In short, the consensus seems to be that both central and local authorities did not seriously address the urban food

supply, which was largely left to the forces of the market. We shall return to this question in the final section of this chapter.

The following investigation of governmental intervention in the urban food supply outside Rome will discuss direct and indirect market intervention. Direct market intervention includes those actions in which the central or municipal authorities participated in the supply, storage and/or distribution of grain. Indirect market intervention is defined as those measures that regulated the workings of the market by either stimulating or discouraging certain behaviour. Finally, the imposition of prices by the authorities merits a separate section.

Market regulation in the pre-industrial world

Market intervention and regulation in early modern Europe may serve as an introduction to remarkably similar phenomena in the ancient world.¹ The food supply of all towns and cities in pre-industrial Europe was carefully regulated, albeit by various means and with varying degrees of success. The motivations and reasons are manifold, but the fundamental cause has undoubtedly to be sought in the precarious living conditions of the urban masses on the one hand, and in the weakness of the market to ensure an adequate supply at moderate prices on the other. Throughout the pre-industrial era, this balancing act required the regular intervention by the authorities in the workings of the grain market.

Several elements combined to make food prices such a pressing concern of the masses of ancient and early modern cities. First, their buying power was so low that most of their income was spent on food. Early modern figures on the consumption pattern indicate that the costs of daily sustenance used up about half to three quarters of the income of the common people in European cities. The situation was undoubtedly similar in most ancient cities.² Secondly, the income of many wage-earners was unstable and may have been threatened by seasonal fluctuations in employment, which were caused, for instance, by the decrease during wintertime of shipment and the subsequent handling of cargoes. Thirdly, when the price of grain rose, urban consumers had little recourse to alternative foodstuffs. Fourthly, under normal market conditions, the agricultural cycle of production led to seasonal price fluctuations. In papal

1 See also Jongman and Dekker (1989) 114f, 120f; Jongman (2000b) 274, 278; Engels (2000) 115.

2 On income and employment, Aldrete and Mattingly (1999) 173.

Rome, consumers were protected from seasonal price increases by means of extreme market intervention and rigid market regulation. Unfortunately, our knowledge of ancient prices is insufficient to assess the seasonal price fluctuations on the urban grain markets. Fifthly, owing to the weaknesses of the grain market, price volatility remained a fact of life in the Roman world. Even though we may lack any statistics regarding income, spending and prices in ancient cities, it is clear that, if the daily sustenance consumed more than half of the income of an average household, the consequences of a prolonged doubling of prices were grave.³ Even if outright starvation could be limited to beggars and vagabonds, the most fortunate among the common people had to eat into their reserves, while the less fortunate were forced to accept more frugal living conditions than they were accustomed to. Finally, as the study of subsistence crises in pre-industrial Europe has shown, increased spending on food necessarily implied a reduction in spending power that was available for other commodities, which meant loss of income for those who – directly or indirectly – catered for the needs of the common people, thereby aggravating the problem. In sum, a prolonged rise in prices could seriously threaten the sustenance and way of life of the urban populace, with all the ensuing consequences for economic and political stability. Hence, price stability – or, at least, a limitation of price volatility – was something to be desired.

It was not only a difference in size that separated the Empire's capital from all other cities in the Roman world, but also a difference in kind. Not only was ancient Rome exceptionally populous, its existence depended on the vast resources of the Empire. In the ancient as well as in the early modern period, most Mediterranean cities largely relied on the resources of their hinterland. It is no coincidence that in the cases of Alexandria, Antioch and Carthage the hinterland consisted of the most productive regions of the Roman world.⁴ Early modern figures show that the long-distance supply of most cities comprised only a few per cent of their total consumption. The situation was undoubtedly similar in antiquity.⁵ However, although long-distance supply was

3 Kohns (1988) 113 is too optimistic when he argues that real famine ensued only when prices had risen fourfold for a prolonged stretch of time.

4 The productivity of Africa and Egypt is evident. On the fertility of Antioch's hinterland, Liebeschuetz (1972) 73, 128; Schneider (1983) 60ff; Wiemer (1995) 283.

5 For example, Mitchell (1993) I 244 on Asia Minor: 'Each city and village, it is safe to assume, attempted to live as far as possible on its own products, above all on the grain which it was able to grow.'

exceptional, it was crucial in those years when the hinterland failed. At such times, a few shipments might mean the difference between hardship and starvation.

The more the cities depended on the production of their hinterland, the more they required mechanisms to cope with natural or man-made harvest failures. As we have seen in chapter [four](#), ancient food supply was characterised by an instability of annual production and a limited infrastructure. Obstacles to communications and the cost of transport hampered the compensation of harvest shocks. To the extent that most ancient cities relied on their immediate hinterland, commercial channels connecting the towns and cities to outside sources of supply did not develop. This was even more true of inland than of coastal cities. External supply therefore often needed the additional incentives offered by local authorities or prominent citizens. The towns and cities of the Roman world were faced with the same difficulties concerning their food supply as the towns and cities of any other pre-industrial society. Until the dawn of the liberal era in the late eighteenth and early nineteenth centuries, most European towns and cities dealt in similar ways with the threat of starvation. In all societies, coping mechanisms favoured the inhabitants of the city over those of the countryside. 'A relationship existed in which the villages had the grain, and the towns had the money, force and legal means to get it.'⁶ 'What these policies did achieve was a shift of the problem from urban to rural loci, and, in parallel fashion, from more core areas to more peripheral areas.'⁷ The similarities in both problems and priorities led to very similar coping mechanisms throughout pre-industrial Europe. Volker Reinhardt observes that one-sided priorities favouring the city to the detriment of rural areas inevitably led to similar solutions.⁸ Owing to the similarity of causes, we see a striking resemblance between coping mechanisms in antiquity and early modern Europe.

6 Reher (1990) 172.

7 Pelizzon (2000) 88.

8 Reinhardt (1991) 437: '... so führen einseitig zugunsten der Stadt und zum Nachteil ländlicher Gebiete gesetzte Prioritäten geradezu zwangsläufig zu analogen Lösungen.' Also, Revel (1979) 37f. Löwe (1986) 304f points out that market regulations in Europe were first created by urban authorities and subsequently taken over by the governments of the emerging national states. Cf. Sharp (2000) 33ff on medieval England. England was the first nation to abandon strict enforcement of its market regulations, which is due to both the influence of the landed gentry and the good performance of the English grain market. See, for instance, Thompson (1971) 83ff; Outhwaite (1981) 389ff; (1991) 35ff. In general, Peyer (1950); Persson (1996) 702ff; Pelizzon (2000) 147ff.

Perceptions of the grain market

The fear of dearth and high prices was widespread in antiquity. 'Give us our daily bread' should be taken literally. In his *Sermons*, Augustine (AD 354–430) wrote that hunger was man-made and not caused by bad weather. Hence, if there was hunger, somebody was to blame.⁹ Roman authorities distrusted the market. The urban traders were subjected to many rules concerning the proper workings of the market. Oaths by traders in Roman Egypt demonstrate that, as in early modern Europe, many rules were intended to ensure transparency of transactions in order to cope with the supposed tendency of traders to manipulate the market. For instance, in AD 327, an egg-seller declared on oath that he would sell his eggs solely in public, not from his home.¹⁰ Similarly, Hadrian prohibited the involvement of middlemen in the fish market of Athens, because, he declared, middlemen only serve to drive up prices.¹¹ The regulation of the grain market was perceived by the members of the ruling elites as a necessity to ensure an adequate supply of the market in most years and to avoid dearth. During the first century BC, for example, a man was flogged in the Aiolian town of Cumae (in western Asia Minor) because he had exported grain during a dearth.¹² Exporting grain in the face of local shortage was considered improper conduct.¹³ Not surprisingly, market failure is often blamed in our literary sources on the immoral actions of landowners and corn merchants, who are generally accused either of keeping their stores under lock and key or of selling their grain to external markets. Invariably their motive is *avaritia*, i.e. greed.¹⁴ Because the morals of the market were sometimes violated, it was recognised by the urban elite that the local market required supervision. In response to rioters who accused him of contributing to a dearth that struck Prusa, Dio Chrysostom censured his audience for their violent behaviour. 'It is necessary to take steps to make it cheaper,' but supervision 'is the course of sensible human beings and in this no one will oppose you.'¹⁵ Similarly, the famous price edict of the emperor Diocletian publicly asserted that low prices were best ensured by curbing the avarice that, according to the emperor, was the source of all economic

9 Augustine, *Sermons* 25.4.

10 P.Oxy. 1.53. Alston (2002) 275.

11 IG II/III² 1103 = Freis (1994) nr. 89.

12 Cicero, *Pro Flacco* 17.

13 Garnsey (1988) 75. In medieval Italy, cities commonly forbade the export of grain. Peyer (1950) 38ff.

14 Lysias 22.15; Demosthenes 56.7f; Cicero, *Dom.* 11; Philostratus, *Vita Ap.* 15; Julian, *Misop.* 368c ff; Libanius, *Or.* 18.195; Ambrose, *Off.* 41. Also Rosivach (2000) 61.

15 Dio Chrys., *Or.* 46.10.14.

problems.¹⁶ Hence, governmental regulation of the food market was perceived as a necessity in order to guarantee the proper operation of the market.

This attitude towards the food market is illustrated in the following passage from the *Digest*, which derives from Ulpian's treatise on the duties of the governor:

In particular, forestallers and regraters, speculators (*dardanarii*) generally interfere with and disturb the corn supply, and a check is put upon their avarice both by imperial instructions (*mandata*) and by enactments (*constitutiones*). By imperial instruction, it is provided: 'You must further ensure that forestallers and regraters, speculators generally, indulge in no commerce and that the corn supply is not incommoded either by those who hold back what they have bought or by the more affluent who do not wish to sell their wares at fair prices (*aequis pretiis*) because they anticipate that the next harvest will be less fruitful.'¹⁷

This passage reveals an attitude that is widespread in the literary sources, where disturbances of the food market are generally blamed on the activities of speculative traders and farmers, who were accused of not merely responding to a crisis, but of causing it in the first place. Famous is Philostratus' account of a food riot in Aspendus, where the shortage was blamed on the actions of the estate-owners living in the countryside.¹⁸ Numerous examples could be given. It is remarkable that not only ancient authors, but also many modern scholars ascribe an influential and detrimental role in the food supply of the cities to the merchants and farmers. Referring to the above passage from the *Digest*, E. Höbenreich, for instance, states that many food shortages were caused by speculating traders, amongst whom were leading aristocrats.¹⁹

Indeed, the general reliance on local supplies opened up prospects for local landowners in times of dearth to exploit their first-hand knowledge of the current situation and thus to corner the market. Even though long-term price developments hardly played a role in the market strategies of commercial farmers, their immediate and natural response to dearth was to make maximal use of the opportunities to make a profit. In the face of

¹⁶ AE 1973, 526b = Freis (1994) nr. 151, 16.

¹⁷ *Digest* 47.11.6pr. Cf. Herz (1988) 179f; Höbenreich (1997) 206ff, 227ff.

¹⁸ Raeymaekers (2000) 275ff stresses the fictional nature of the story. On Philostratus, *Vita Ap.* 1.15 see also Flinterman (1995) 111f.

¹⁹ Höbenreich (1997) 214 ('die Kosten . . . auf künstliche Weise in die Höhe getrieben'), 304f. Similarly, Strubbe (1989) 106, 117: 'Grain shortages were often created artificially by rich landowners.' Cf. Jongman and Dekker (1989) 116.

dearth, prices rose and hence the threshold of transport costs diminished. Commercial farmers sold their grain to those markets where prices and buying power were highest, which was often not the nearest town. Alternatively, they awaited further price rises, which naturally occurred in winter and spring, when the reserves of peasants and small-scale producers had been consumed. To our modern understanding, the ancient landowners exhibited the kind of market-oriented and profit-maximising behaviour that was to be expected of them. Even stronger, the liberal economists of later times would argue that the forces of the market, if not subjected to governmental interference, offered the best assurance of a well-provisioned market. The idea was that merchants and farmers who responded to price rises by hoarding and exporting increased carry-over and market integration, and thus improved the workings of the market. However, neither consumers nor authorities in the Roman world seem to have been sensitive to this argument.

In times of dearth, farmers and merchants may have hoarded or exported more than they normally did, which makes it understandable that both authorities and common people confused cause and effect, thus leading to the accusation of speculation. It may be doubted, however, whether merchants and landowners were often in a position actually to cause shortages, rather than merely to respond to harvest shocks. Wealthy and powerful grain merchants seem to have been rare – or even non-existent – in antiquity. In early modern Europe, the ‘tycoons’ of the grain trade only operated in the supply of large cities, such as London or Paris. Their numbers were too large, however, to allow one or even several merchants to manipulate the supply of either capital’s grain market. The situation was undoubtedly similar in the ancient world, where large cities relied on the shipments of many merchants, while most towns were too small to involve grain merchants normally. Towns and small cities largely relied on the farmers and landowners in the immediate hinterland for their grain supply. The wealthiest members of the aristocracy may have owned enough land to feed a small town many times over, but their estates were usually dispersed over a wide territory. Again, the numbers seem to have been too great to allow individual farmers to exert much influence on the market, since the risks of speculative marketing were great. Farmers who hoarded their grain ran the risk of seeing their neighbours getting away with a good profit, while their own stores became worthless with the arrival of the new harvest. Hence, farmers who hoarded their grain or sought profitable external markets responded to disturbances of the market rather than causing

them.²⁰ The emphasis on speculators in literary and legal writings of the ancient world seems to stem from a paranoid mistrust of the market. Modern scholars should not make the mistake of taking such accusations too much at face value.

Involvement of Roman authorities

The above passage from Ulpian shows the involvement of the provincial governor in the workings of the local food markets. Governors were ordered to act against speculators and thus to ensure an adequate supply of foodstuffs to the markets. In the early second century BC, hoarding had been an offence in Rome, which was punished by the *aediles*.²¹ The *lex Iulia de annona* dealt with speculation and regulation of the grain market.²² It seems unlikely, however, that the *lex Iulia* offered the basis for the prosecution of speculators in the provinces.²³ Municipal constitutions in the West, which were modelled on Roman law, provide a further example of Roman influence on market conditions in provincial towns and cities.²⁴ The extant Spanish examples seem to indicate that these municipal constitutions were uniform.²⁵ As is shown by an example from the first century AD from the town of Irni, they contained an anti-speculation clause that is reminiscent of the text of the *Digest*.²⁶

No one in that *municipium* is to buy up or hoard anything or join with another or agree or enter into a partnership in order that something may be sold more dearly or not be sold or not enough be sold.²⁷

While it may be true that such a clause did not add any new instrument to urban market regulations, it did provide some uniformity to regulations in Roman-founded towns and cities of the West.

The most important impact of the Roman Empire on market regulation, however, may have been that its enforcement, which had previously been the prerogative of members of the local ruling class, was altered by

20 Regarding the food crisis that struck Antioch in AD 362/3, Wiemer (1995) 294 concludes that the speculation of the landowners made the situation worse, but did not cause the problems in the first place.

21 Livy 38.35.5. See also *Digest* 5.1.53.

22 Herz (1988) 81ff; Höbenreich (1997) 152ff. Höbenreich's (pp. 171ff) hypothesis that the *lex Iulia* was primarily intended to fight the use of the grain supply as a powerful weapon in civil strife is not very convincing.

23 Höbenreich (1997) 166ff. Contra Herz (1988) 107f. Refuted by De Ligt (2002) 14.

24 Garnsey (1988) 78.

25 Lintott (1993) 140ff.

26 Thus, Höbenreich (1997) 217f.

27 Quote from Garnsey (1988) 78f.

the presence of Roman authorities. Cicero provides an interesting example from his time as governor of Cilicia, during which he intervened in the local market during a famine in 51 BC:

My tour through Asia was such that even famine – the worst possible misery – which existed in my province owing to the failure of the crops, gave me a welcome opportunity. Wherever I went, without force, without legal process, without hard words, by my personal influence and exhortations, I induced Greeks and Roman citizens, who had stored corn, to promise a large quantity to the people.²⁸

A further example is provided by an inscription honouring the Roman governor for his intervention during a shortage in Antioch (Pisidia) in AD 93. He is called ‘patron of the city’ because he took care of its corn supply. We are told furthermore that the *duoviri* and council of the city approached the Roman governor because of a dearth and that they requested him ‘to provide an opportunity to purchase for the populace’. He saw to it that private stocks above personal needs were sold and thus supplied the market.²⁹ Provincial governors forced debtors to municipal grain funds to pay their debts. Moreover, the provincial governor tried cases involving illegal oil exports in Athens. During the reign of Marcus Aurelius and Lucius Verus, the *iuridicus* Arrius Antoninus was sent by the emperors to intervene in the supply problems of Concordia.³⁰ Interestingly, we also find a *iuridicus* intervening in the market in Oxyrhynchus in AD 246, who ordered that all private stocks of grain had to be declared within one day.³¹ Finally, a *sitophylax* from the city of Cyzicus (Asia) honours the governor of Thrace for restoring harmony between Cyzicus and the city of Perinthus (Thrace). The fact that the inscription was published on the authority of a corn official means that matters of grain supply must have been involved in the dispute.³²

The above examples invite two observations. First, market regulation on behalf of urban consumers and the instruments that were available to the local elite had probably not changed much since the Classical or Hellenistic Greek world.³³ However, the presence of Roman authorities significantly altered the workings of market intervention and regulation.

28 Cicero, *Att.* 5.21.8.

29 AE 1925, 126 = Freis (1994) nr. 65 = Wiemer (1997) 200.

30 CIL 5.1874. Ziegler (1977) 33 n. 25; Mrozek (1994) 98.

31 P.Oxy. 42.3048 = Rowlandson (1998) nr. 174. A similar measure had been taken in Oxyrhynchus in AD 191. See below.

32 See Garnsey (1988) 73, in general 258ff. Admittedly, the dispute may have concerned the trade in grain between Cyzicus and Perinthus in general. Dearth or famine is not necessarily implied.

33 Likewise, Garnsey (1988) 266.

On the one hand, the Roman emperor controlled huge amounts of corn and on occasion made these stocks available to provincial cities. On the other hand, urban rulers and their subjects could count on the intervention of provincial governors, who had the power and authority to force foreign traders, rich landowners and neighbouring communities into compliance.

Secondly, regulations are of limited scope. Ancient market regulation reflects the general reliance on local suppliers and their responses to dearth. In some cases, the authorities of towns and cities may have offered incentives to traders in order to improve the supply of the urban market. Most commonly, the relationships with individual traders were stimulated by granting them social honours. Many instances survive from the Hellenistic period.³⁴ In contrast, few examples of economic stimuli are known. Aeneas Tacticus gives the advice to offer guaranteed profits to traders in times of war.³⁵ In addition, we find exemption from taxes to landowners who brought their goods to town. In the East, such privileges were already given during Hellenistic times. For example, in a letter to the council and people of the Carian city of Heracleia, Antiochos III's governor Zeuxis confirmed the exemption from taxes (*ateleia*) regarding grain that was brought into the town and sold there.³⁶ Exemption from taxes was more often extended temporarily to imports of foodstuffs during festivals and/or periodic markets. The purpose of such measures undoubtedly was to do away with any fiscal obstacles that would hamper the food supply of the town for the duration of the market or festival, which was the more important since large masses of visitors would increase the stress on the local food supply.³⁷ In general, however, governmental measures to stimulate market supply seem uncommon.

Because the authorities 'did not seek a lasting solution to the underlying problems', it has been said that the attitude of the elite in Roman times was limited to ad hoc responses.³⁸ Indeed, municipal officials did not attempt to exert much influence on the external supply of the urban market and the wholesale trade. The main reason for this is that the activities of external suppliers and merchants were beyond their control. Municipal regulations merely prescribed the workings of the local market under various conditions. The idea underlying most regulations was that local supplies must be made available to consumers without deceitful

34 Examples in Garnsey (1988) 71f; Gallant (1991) 182ff; Quass (1993) 241ff; Sosin (2002) 135ff.

35 Aeneas Tacticus 10.12.

36 SEG 37.859. Brodersen (1999) 451. Wörrle (1988a) 468f.

37 De Ligt (1993) 45ff, 230.

38 Garnsey (1988) 83.

practices. Provincial authorities offered support in the implementation of local regulations, but they did not intervene on their own initiative in local affairs. Throughout the imperial period, towns and cities remained self-governing bodies. The Roman authorities expected the local elite to rule their communities by influence and authority, while they supported prominent cities by subventions of corn and access to external markets. If market regulations were limited to superficial control of grain within the margins of a weak market, this was not the result of a lack of interest, but of a lack of means to address the shortcomings of the market. One should not censure ancient authorities too much for their failure to find the solution for the weakness of the market. On the one hand, the Roman Empire lacked the incentives that the governments of the European nation-states had to intervene in market conditions. On the other, the introduction of a liberal economic policy during the late eighteenth and early nineteenth centuries was only a success as a result of the increase of market integration, which was not due to any change of governmental policy.

MUNICIPAL GRAIN FUNDS

Introduction

An inscription in honour of Q. Popillius Python, high priest of the imperial cult and *agonothetes* of the Macedonian *koinon*, informs us of his various gifts within the province: he paid for the repair of roads, financed theatrical plays and gladiatorial games, he sold grain under market prices, and so forth.³⁹ Popillius Python, who had represented his native town of Beroia as envoy to the emperor Nerva, evidently was a very wealthy man. In the eyes of those scholars who regard the supply of cheap grain as either incidental or as a bonus to a privileged few, Popillius' acts of beneficence may seem typical. The selling of grain under current market prices, it may be argued, was not dissimilar to the games, plays and gifts on which Popillius spent his money. Hence, Popillius' actions were unrelated to the inadequacies of the grain market. Only in times of dearth was the supply of grain by people like Popillius a response to a disturbance of the urban food supply. In other words, it is argued that the food supply was generally left to the forces of the market, while

39 SEG 17.315 = Freis (1994) nr. 91. More examples of private individuals who sold grain below market price in imperial times are given by Quass (1993) 264ff.

intervention in times of dearth was largely limited to the initiative of individual civilians.⁴⁰

It is not denied that the gift of food or the selling of cheap grain by private citizens was often purely an act of beneficence, intended not so much to address the problems of the urban food market as to confirm the social position of both parties involved. However, we have ample evidence that permanent institutions existed that did not rely on the initiative of private citizens, and whose prime purpose was to ensure in all years an adequate supply of grain. The prime source for their widespread existence consists of the epigraphic attestations of grain funds and their officials. Asia Minor has yielded many inscriptions on the municipal *sitonia* and its officials the *sitonai*. The evidence has been analysed by Johan Strubbe and we may summarise a few of his conclusions. First, the inscriptions that show the existence of a grain fund derive from all parts of Asia Minor. Grain funds were not limited to those cities that structurally or temporarily had trouble with the food supply.⁴¹ Secondly, most inscriptions date to the second or early third century AD, but the scarcity of attestations in the first century or the second half of the third century does not imply that the *sitonia* was not in existence at these earlier or later periods.⁴² It may be pointed out that already at some date between 218 and 209 BC, a permanent *sitonia* fund was established on Delos.⁴³ Thirdly, direct market interventions that were similar to the *sitonia* existed in Asia Minor in the Hellenistic period, but the *sitonia* became a permanent magistracy during the Principate. Strubbe emphasises that 'there is no proof that *sitonai* were appointed only during a food crisis, as some scholars believe.'⁴⁴

The *sitonia* or similar schemes also existed elsewhere in the Roman world, in particular in the East, but the attestations are not as widespread as in Asia Minor. Are we to assume that grain funds as a permanent institution were not as common elsewhere? The profuseness of evidence regarding Asia Minor does not necessarily indicate that urban policy towards food supply was significantly different here from all other regions of the Empire. First, regional differences in the epigraphic attestation of grain funds may be caused by differences in the number, nature and content of inscriptions honouring leading citizens. Secondly, in many cities of Asia Minor the existence of the *sitonia* is solely attested by the

40 e.g. Garnsey and Morris (1989) 104.

41 Strubbe (1989) 99f.

42 *Ibid.* 101.

43 Reger (1993) 318. On *sitonai* in Hellenistic Greece, Stefan (1974) 654ff; Quass (1993) 238ff; Reger (1993) 302f, 317ff, 326ff; Migeotte (1997) 39; (1998); Engels (2000) 119ff.

44 Strubbe (1989) 102. See also Dirscherl (2000) 5.

mention of a *sitones*. In other places, in particular the smaller ones, the same functions may have been performed by magistrates who were more generally involved in the market or food supply, such as *agoranomoi*.⁴⁵ In the Hellenistic world, *agoranomoi* are attested as the ones who purchased public grain.⁴⁶ Also in Caere in AD 114, we find an *aedilis* in charge of the grain supply.⁴⁷ The fact that, according to a ruling from Severan times, *aediles* were punishable for the inadequate supply of their town supports the supposition that provisioning of the market in many towns in the western half of the Empire was mainly the responsibility of *aediles*.⁴⁸ The existence of a grain fund may thus be hidden by a less specific title. On the other hand, the municipal policy towards food supply seems indissolubly connected to the political and social structure of the urban community, which means that grain funds like the *sitionia* in Asia Minor, though common in many parts of the Empire, need not have existed or functioned in the same way everywhere. No grain funds are known in Egypt, despite the wealth of evidence concerning food supply.⁴⁹ In the western provinces, it may have been more common to appoint prominent citizens when the need arose.⁵⁰ For example, at one time during the reign of Augustus or Tiberius, M. Messius Gallus and his brother were appointed *aedilis curator* in Narbonne. The brothers Messii, who were not citizens of Narbonne but of Béziers, were apparently chosen because of their wealth and connections.⁵¹ We do not know, however, if in normal years the tasks pertaining to the acquisition and storage of public grain were part of the duties of regular magistrates in Narbonne.

Further evidence is offered by literary and legal sources. Herodian offers the following remark concerning the tyrannical reign of Maximinus Thrax: 'If there were any public treasuries, gathered on behalf of food stores or reserved for theatres and festivals, he expropriated them.'⁵² The

45 As probably in Aphrodisias, Prousias and Pessinus. Strubbe (1989) 105. Possibly also in Hellenistic Kallatis. Stefan (1974) 656, who also observes that *archontes* sometimes dealt with matters of food supply. Foster (1970) 128 (and further) rightly points out that 'the Greek word *agoranomos* had a long history and meant the same thing at different times and different things at the same time.' See also pp. 131, 134f. On officials dealing with food supply in Egypt, Alston (2002) 190ff.

46 Quass (1993) 248f; Migeotte (1998) 232.

47 CIL 11.3614 = Freis (1994) nr. 95.

48 *Digest* 16.2.17.

49 Sharp (1998) 310.

50 Dardaine and Pavis D'Escurac (1986) 293. The sole attestation of a private contribution to a grain fund in the Western provinces is CIL 8.21077 = Dardaine and Pavis D'Escurac (1986) nr. 15. Cf. Dirscherl (2000) 14.

51 CIL 12.4363 = Dardaine and Pavis D'Escurac (1986) nr. 1, *Ibid.* p. 292.

52 Herodian 7.3.5.

passage invites three observations. First, Herodian apparently regarded grain funds as being among the most common in the cities of the Roman Empire. Secondly, he makes no distinction between grain funds and financial reserves for theatrical plays or festivals.⁵³ Thirdly, Herodian states that the public funds were intended to procure food reserves. Herodian apparently associated such funds primarily with the collection of stores rather than with public meals or free gifts.

The writings of the jurists leave no doubt that the grain funds were considered of special importance. The following is one of several rulings in the *Digest* that were taken from the writings of the Severan jurist Ulpian:

A debtor to the corn account is to settle as soon as possible from his own resources. For the corn account which is necessary to all communities must not suffer from delayed payment, but debtors may be forced to payment by the governor of the province if he has any in this position.⁵⁴

This ruling explicitly regards grain funds (*frumentaria pecunia*) as a necessity for all towns, which would have made little sense if most towns and cities were without a grain fund. Grain funds were apparently not only common in the early third century AD, they were also regarded as crucial for the functioning of a city.

Grain funds and euergetism

Most modern historians observe that the market intervention in the Greek East depended on private benefaction, because of the cities' chronic shortage of public capital.⁵⁵ Garnsey and Morris go even further and state that: 'the dependence of the cities on private benefaction only advertises the weakness of the public response to the inevitability of food shortage.'⁵⁶ Several inscriptions commemorate the private gift of money to a municipal grain fund. One of the inscriptions from Asia Minor, which dates to AD 237, mentions the gift of 1,000 *drachmae* to the town of Orkistos. The text explains in detail that the interest on this sum had to be used to finance the yearly distribution of bread during the festival of

⁵³ Thus, it can not be argued that Herodian – out of animosity towards Maximinus Thrax – exaggerated the importance of the grain funds for the subsistence of communities involved.

⁵⁴ *Digest* 50.8.2.3.

⁵⁵ Kloft (1988) 129; Quass (1993) 247.

⁵⁶ Garnsey and Morris (1989) 104. Likewise Alcock (1993) 113. Garnsey (1988) 86: 'The dependence of the cities on their most wealthy and influential citizens advertises the limitations of the public response to the inevitability of food shortage.'

Eudaimosyne. However, as Strubbe points out, this case is very unusual, since it is more related to the annual festival than to the town's food supply. Strubbe therefore argues that, although the fund is called a *sitonika*, the scheme was unlike the other cases of *sitonía*.⁵⁷

More typical is the legacy of the imperial freedman Publius Aelius Onesimus to the grain fund of Nacoleia (Phrygia). The inscription is dated to the reign of Hadrian. Indicative of the difference between the two cases is the sum involved. While in AD 237 a mere 1,000 *drachmae* financed the distribution of bread at the festival, Aelius Onesimus had legated 200,000 HS, which sum had to be lent out at interest as well. 'The interest that accrues they should deposit in the grain fund (*sitonika*) during the next three years in order to buy annually as much grain as the money allows.'⁵⁸ After a period of three years, the interest was to be divided among his fellow citizens. Although the inscription informs us that during the first three years grain had to be bought, it does not say whether the grain had to be distributed annually or whether the three consecutive acquisitions were intended to build up a grain reserve. If we assume that the interest was 6 per cent, that the price of a *modius* of grain was HS 2½ and that the average adult consumed 3 *modii* per month, Onesimus' capital might have bought annually enough grain to feed 1,600 people for a month. If the intention was a grain reserve, three years were sufficient to accumulate enough grain to feed the entire population of a small town for a month. Note, however, that this is merely one contribution to the grain fund. We do not know how much more capital or grain the fund possessed.

Mere attestation of a gift to a grain fund or of an official like the *sitones* offers little information concerning the purpose and functioning of such schemes. The main task of the *sitonai* obviously was to acquire grain. This is confirmed by the *Digest*:

Also, the supervision of the purchase of corn or oil – for supervisors of these goods, who are called *sitonai* and *elaionai*, are regularly appointed – fall among the personal *munera* in some communities.⁵⁹

The passage shows that the main task of *sitonai* was to buy grain. The statement that the office was a *munus* in many towns derives from the

57 Strubbe (1989) 110. However, Strubbe (1994) 178 suggests that grain funds may have been related to festivals in more towns, although the fund from Orkistos remains the only known case.

58 CIL 3.6998 = Strubbe (1987) nr. 53 = Eck and Heinrichs (1983) nr. 343.

59 Arcadius Charisius, *Digest* 50.4.18.5, taken from his work *de muneribus civilibus* (on the public duties of citizens).

writings of the late Roman jurist Arcadius Charisius. We cannot be sure to what degree this applied to the second or third centuries AD. However, a ruling from the reign of Hadrian states that philosophers, rhetors and doctors were exempted from the duty of gymnasiarch, *agoranomos*, *sitones* and *elaiones*.⁶⁰ This seems to imply that already in Hadrian's time, these functions were seen as *munera*. Other magistrates that are mentioned in inscriptions and legal sources usually dealt with the management of finances.

In the above passage from the *Digest*, 'oil buyers' (*elaionai*) are mentioned as a parallel to 'grain buyers' (*sitonai*). A decree of the emperor Hadrian sheds light on the mechanisms that the city of Athens employed in the acquisition of olive oil. Hadrian decreed that local producers had to sell one third of their olive oil to the official 'oil buyers':

Oil producers shall deliver one third . . . They shall make delivery in instalments at the beginning of the harvest, in proportion to the amount being harvested, and they shall [give it] to the *elaionai* who look after the [public requirements].⁶¹

In addition, when farmers sold their olive oil for export, they had to declare to whom they had sold the olive oil and where his ship was sailing. Exporters in turn had to declare from whom they had bought olive oil and what their destination was. Farmers and merchants who had committed a breach of this law lost part of their olive oil to the city; offenders who appealed to the emperor or the provincial governor had to sell to the public depot at current market prices. Dispensations were given in the case of an exceptionally good harvest:

If from an abundance of oil at any time the amounts of one third . . . being deposited are in excess of the public requirements for the whole year, it shall be permitted as follows to those who have not as yet delivered either all or part of their oil. First they shall make out a second declaration stating, in respect to a public share owed at that time, how much it is that the *elaionai* and the *argyrotamiai* do not want to accept from them, which, on the one hand, they owe . . .⁶²

The situation seems to have been that the city's oil buyers kept the requirements of the city constantly in mind. Part of this requirement obviously was for direct consumption on behalf of the city. However, as

60 Modestinus, *Digest* 27.1.6.8. However, Hadrian's measure was partly reversed under his successor. Quass (1993) 381.

61 IG II/III² 1100 = SEG 15.108, 21.501 = transl. Oliver (1953) 962. Cf. transl. Freis (1994) nr. 85. See Boatwright (2000) 91 on the extraordinary nature of Hadrian's involvement in this case.

62 Boatwright (2000) 91.

the strict regulations for the control of exports show, the law was not just a scheme to ensure a cheap supply of oil to the city's gymnasia. The control of export and the purchase by public oil buyers of one third of the entire output leaves no doubt that the purpose of this law was to ensure an abundant and stable supply to the local market.

Athens was not just a Greek city to Hadrian – the situation prescribed by his decree may therefore have been out of the ordinary. However, the decree uses the widely known term *elaionai* for the ones who bought the oil, and we know from Arcadius Charisius *Digest* (50.4.18.5) that the main task of *elaionai* and *sitonai* in general was to buy oil or grain. Although the mechanisms employed in Athens were probably not exactly the same as those in other cities, the use of coercive purchase may have characterised the means employed by 'oil buyers' and 'grain buyers' elsewhere.⁶³ Support for this hypothesis comes from a ruling in the *Digest*, which shows that some cities used political force to claim their share of local produce: 'Furthermore, some communities have the right to demand that those who hold properties in their territory provide each year a certain quantity of corn according to the extent of their land.'⁶⁴ Similarly, Ulpian mentions that it was usual for landowners to sell part of their produce to neighbouring cities at a low price.⁶⁵

Coping with shortages?

The purpose of the grain funds is disputed. Strubbe regards the distribution of bread at the annual festival of Eudaimosyne as unusual, but he also rejects the idea that the grain funds were intended to cope with local shortages. 'The assumption that the *sitionia* was intended to purchase grain quickly in times of shortage and that it worked only in emergency circumstances, is not correct in our opinion.'⁶⁶ His argumentation may be summarised as follows: The *sitionia* was largely a matter of euergetism, since 'the funds apparently consisted mainly of contributions from private benefactors.'⁶⁷ Grain was bought each year, since otherwise *sitonai* need not have been appointed annually. The *sitionia* apparently required the

63 In this context, one may point out that fourth-century BC Athens levied a tax in kind on the islands of Lemnos, Imbros and Skyros, the produce of which was sold each spring to the Athenian populace. On the inscription from 374/373 BC, Stroud (1998); Harris (1999); Engels (2000). Rosivach (2000) 39 n. 24 points out that nothing is heard of this law in subsequent years. Hence, the law may have been repealed or ignored.

64 *Digest* 50.4.18.25.

65 *Digest* 7.1.27.3.

66 Strubbe (1989) 117.

67 *Ibid.* 116.

regular investment of additional money, which means that the capital employed in the purchase of grain was not recovered by its sale to the citizens. The funds were insufficient to make much of a difference to a city's food supply, the more so when grain had to be bought during a dearth. In other words, the grain funds did not build up reserves and were not concerned with shortages or market price. These considerations lead Strubbe to interpret the *sitionia* as the yearly distribution of free grain to the citizens, which means that 'corn doles occurred on a much larger scale during the Principate than most scholars have accepted up to now'.⁶⁸

Strubbe's conclusion seems to owe much to the *a priori* assumption that 'the city authorities generally refrained from interfering in commerce and other economic activities'.⁶⁹ Hence, he sees grain funds mainly as a private concern. Indeed, in Asia Minor funding appears to have been primarily private and voluntary.⁷⁰ Apart from gifts and legacies, some *sitonai* in Asia Minor contributed their own money and returned the public money unused.⁷¹ However, we should not confuse private contributions to public funds with, for instance, the establishment of private funds that were intended to finance private benefactions, such as banquets or *sportulae*. In addition, the epigraphic sources, which remain silent on other kinds of funding, may distort the picture somewhat by focusing too much on honourable activities of equally honourable benefactors.⁷² The *Digest* sheds additional light on the grain funds. As we have seen above, very strict regulations regarding debts that were owed to the grain fund clearly show the authorities' concern for its solvency. Payment of debts to grain funds was considered important enough to involve the provincial governor. The other rulings from Ulpian confirm these conclusions. Financial reserves that had been transferred from the grain fund for other purposes had to be refunded with interest.⁷³ Debts to the grain fund were not to be settled with expenses for other municipal purposes.⁷⁴ No such regulations are known concerning financial reserves on behalf of theatrical plays or gladiatorial games.⁷⁵ The legal evidence seems to show that at least in the early third century AD grain funds were a municipal, not a

68 *Ibid.* 114. Accepted by Dirscherl (1999).

69 Strubbe (1989) 116.

70 Migeotte (1998) 237 shows that some funds in the Hellenistic world received funding annually.

71 On the private financing of grain funds, see also Dirscherl (1999) 68ff; (2000) 19ff.

72 Thus, the comment by Pleket in SEG 39.1775.

73 *Digest* 50.8.2.2.

74 *Digest* 50.8.2.4.

75 On the contrary: money that had been donated to a town with the express intent of organising games was not to be used for that purpose. However, *Digest* 50.8.6(4) is late Roman.

private affair. More so: the financial standing of the towns and cities was of great concern to the Roman authorities, and this interest apparently significantly involved the grain fund.

The annual appointment of *sitonai* need not imply annual acquisitions of grain. Decisions necessarily had to be made in the short term, because they depended on the current market situation and the expectations regarding the next harvest. Hence, *sitonai* may have been appointed to make this decision annually. Apart from the exceptional case of the distribution of bread at the festival, there is little in the *sitonia* inscriptions from Asia Minor to indicate annual distributions of grain or bread. Moreover, evidence for corn doles outside Rome is limited to a few cities in Lycia in the second century AD and Egypt in the third century. Apart from Antinoopolis, the regular distribution of grain or bread in Egypt is clearly shown only in Alexandria, Hermopolis and Oxyrhynchus in the second half of the third century.⁷⁶ The situation in Antinoopolis is obviously exceptional,⁷⁷ and may have a closer parallel in the corn dole that Hadrian possibly presented to the populace of Athens⁷⁸ than in the schemes in the other Egyptian cities more than a century later. There is no evidence on the fate of Hadrian's schemes in Antinoopolis and Athens in later times.

The evidence pertaining to Lycia consists of a few inscriptions that mention *sitometroumenoi andres* as recipients of gifts from civic benefactors.⁷⁹ In Xanthus, Opramoas gave 1,000 *drachmae* each to the city council, the council of the elderly and to the *sitometroumenoi andres*. Unfortunately, the inscription does not inform us about the number involved. In Tlos, 1,100 *sitometroumenoi andres* received one *denarius* from a lady called Lalla.⁸⁰ At Oenoanda, 500 *sitometroumenoi andres* are

76 Garnsey (1988) 84: 'Permanent funds financing regular distributions were a rarity.' He also shows (79ff) that food distribution systems in Classical Crete and Hellenistic Samos were exceptional cases. Cf. Gallant (1991) 172f. Further evidence and discussion concerning the imperial corn doles in Kloft (1988) 137ff; Sharp (1998) 140, 157ff; Dirscherl (1999) 74ff, 87ff. The distribution of grain in Hermopolis in AD 261 was related to the beginning of the reign of Macrianus and Quietus. Sharp (1998) 157 (cf. 163) notes that the evidence concerning Hermopolis 'may refer to a one-off measure, but the possibility that a regular institution was being established is strengthened by our knowledge of what happened at Oxyrhynchus'. Cf. Alston (2002) 192, 276.

77 Sharp (1998) 162. On the privileges granted to Antinoopolis by Hadrian, Boatwright (2000) 190ff.

78 Cassius Dio 69.16.2 merely says that Hadrian gave an 'annual grain supply' to Athens. Spawforth and Walker (1985) 90 suggest that this is not a corn dole but either the annual supply of grain or an annual endowment for the purchase of grain. Cf. Millar (1977) 422; Boatwright (2000) 92.

79 Garnsey (1988) 262f; Dirscherl (2000) 23ff.

80 Naour (1977) 265–90.

mentioned. Moreover, a few inscriptions from this period mention the *sitometreia*. However, the frequency of the grain distribution remains unknown, while also the exact meaning of *sitometroumenoi andres* is disputed. While most scholars interpret it as 'grain receivers', Wörrle has suggested that the term indicated those who financed a municipal grain fund.⁸¹ It may seem attractive to treat the Lycian evidence as a parallel to the *sitionia*, but it is not certain that this comparison is warranted. Since the evidence on the *sitionia* does not indicate the existence of either a *sitometreia* or of *sitometroumenoi andres*, we should probably treat both kinds of evidence as separate phenomena, which merely indicate an institutionalised concern for matters of grain supply. In short, there is no firm evidence to support the suggestion of corn doles throughout the cities of Asia Minor. Although capital had to be added regularly to the fund, it is not necessarily implied that grain was bought each and every year. It is even less likely that the grain fund was used for handing out grain once a year.

While Strubbe argues that grain funds in Asia Minor lacked the means to be effective in times of dearth, the point of a permanent grain fund may have been precisely to avoid the necessity of having to buy grain during a shortage.⁸² Early modern grain funds may offer some clarification in this regard. The purpose of the grain funds in pre-industrial Europe was to store grain reserves in good years to be used in bad years. The idea was that grain could be bought cheaply in years of abundant harvests and sold below market prices in bad harvest years. Communal granaries in medieval Italy also sold grain in the pre-harvest period.⁸³ In other words, grain funds were a response to the lack of sufficient carry-over on the market. In practice, however, these schemes suffered chronically from a shortage of funding. The main problem was that bad harvests were unpredictable events. K.G. Persson points out that carry-over by public granaries was as unprofitable as speculative carry-over by merchants. 'With few exceptions, public granaries were unable to remain financially solvent over long periods.'⁸⁴ Hence, the operation of these funds slackened after a row of good harvests, while the municipal stores deteriorated. As a result, whenever it became clear that the next harvest would fail, or when shortage

81 SEG 38.1462B; Wörrle (1988b).

82 Cf. Migeotte (1998) 229, who argues that grain funds in the Hellenistic Greek world were not intended to take over the urban grain supply, which depended on private trade, but to intervene in the market when private supply was lacking and/or grain prices high.

83 Peyer (1950) 138ff.

84 Persson (1996) 709. See for example the grain fund in Cuenca (Castile), Reher (1990) 160.

occurred unpredictably (in early modern Europe often a result of war-related requisitions or devastation), the municipal magistrates had to buy grain at high prices, which they subsequently sold to the urban populace below market price. However, despite the high costs involved and the often catastrophic failures of such schemes, they were never abolished. The point of this comparison is to counter Strubbe's arguments that, first, grain must have been issued for free, because the schemes required the regular investment of capital, and, secondly, that grain funds were not intended to ameliorate the effects of harvest failures, because they were ineffective.

A riot in the town of Prusa provides some significant parallels. In the late first century AD, one of the leading citizens of this town was the wealthy landowner Dio Chrysostom. As one of his orations informs us, Dio Chrysostom was threatened by the populace, together with an unnamed neighbour, to be 'stoned or burned to death'.⁸⁵ His defence sheds interesting light on the accusations made against him and his neighbour:

No man is more blameless than I am in connection with the present shortage. Have I produced the most grain of all and then put it under lock and key, raising the price? . . . Nay but, some one may claim, though I lend money, I am unwilling to supply it for the purchase of grain. There is no need for me to say anything on that score either, for you know both those who lend money in our city and those who borrow.⁸⁶

As the rioters felt the consequences of a shortage that had struck the city of Prusa, Dio Chrysostom was not only accused of hoarding grain and thus contributing to the shortage, but also of refusing to contribute capital for the purchase of grain. The rioters did not expect Dio to buy grain himself, but to supply money, probably to a grain fund. The situation is not unlike an *epidosis*, the collection of money to be spent on a public purpose that was decided by decree. According to Strubbe, *epidoseis* were a good way to raise money in the case of an emergency and they are known to have occurred in relation to grain funds.⁸⁷ Although there is no indication of an *epidosis* in the above case, the rioters in Prusa used very persuasive arguments to urge wealthy citizens to contribute money to a grain fund. The line between voluntary gifts and coerced contributions often becomes very thin.⁸⁸ The similarity with early modern grain funds is obvious: they often lacked the necessary means precisely when the need was highest.

85 Dio Chrys., *Or.* 46.4. 6. II.

86 *Ibid.* 46.8. Cf. Quass (1993) 253f.

87 Strubbe (1989) III. Cf. Stefan (1974) 655 regarding the private contributions to grain funds of the Greek cities on the Black Sea: 'eine Zwischenform zwischen Darlehen und *epidosis*'.

88 Likewise, Kloft (1988) 131.

As the activities of private citizens in times of shortage show, private and public mechanisms are indistinguishable in the Roman world. *Sitonai*, *agoranomoi* and other magistrates often financed their 'public' activities from their own private funds.⁸⁹ In addition, there is ample evidence that the wealthiest citizens stepped in during shortages and supplied the market with cheap grain – or rather, they made corn available at a price that was below market level, but probably still high. Honorific inscriptions often inform us about such activity: as we have seen, Q. Popillius Python from Macedon was honoured because he had 'sold grain below market price and lowered the price in times of dearth'.⁹⁰ It is not only local landowners who are often praised for their intervention in times of dearth, but also outside traders. In sum, while grain funds were permanent institutions, which received funding more or less regularly, there appears to have been a wide range of interrelated responses to immediate shortages that included public decrees to increase the available capital of the grain fund, or private initiatives to contribute capital to the grain fund or to (purchase and) sell grain cheaply.

Social networks

The effectiveness of direct market intervention by municipal institutions depended not only on adequate funding, but also on the degree to which magistrates had access to grain. The inadequacies of the free market necessitated the intervention of municipal institutions in order to make more grain available at lower prices to the community's citizens. However, the question remains whether the mechanisms that were available were sufficiently strong to improve on the workings of the market. The municipal schemes had three advantages in comparison to the free market. First, the capital that was amassed by the local elite offered more buying power than the urban populace itself could have realised. Secondly, the prestige and standing, not only of the magistrates, but also of the individual members of the elite that were involved, offered an additional incentive to landowners and merchants to supply grain. Thirdly, local authorities had the means to use coercion to enforce the supply of the market. While the first two factors applied externally as well as

89 Dardaine and Pavis D'Ecurac (1986) 294ff. Regarding the Hellenistic period, Quass (1993) 247ff notes that the function of officials involved in grain supply required that they possess personal wealth. See also pp. 264ff on the imperial period.

90 SEG 17.315 = Freis (1994) nr. 91. Cf. TAM 3.1.4 (2nd cent. AD).

internally, political coercion was generally limited to the immediate hinterland.

Unfortunately, the sources are often silent on the origin of the grain that was made available by the intervention of municipal institutions. When merchants are honoured for their supply of cheap grain, we may safely assume that they had bought the grain on the market. In one case from the early Empire, two *decuriones* from Gaul honour their *amicus et sodalis* for his contribution to the supply of their home town. This citizen from Carthago Nova was possibly involved in provisioning the Roman armies along the Rhine.⁹¹ Wealthy members of the local elite, such as Q. Popillius Python, may have contributed the produce of their own estates, or they may have bought grain on the open market. Strubbe suggests that the *sitonai* in Asia Minor often bought the grain through the agency of grain merchants, because the urban elite preferred not to be involved in anything that was commercial.⁹² However, the wealth of the urban elite was based on the produce of their estates and tenants, and most magistrates and councillors were surely aware of the workings of the market in grain and other major crops.⁹³ Moreover, there is no evidence that points in the direction of commercial middlemen or contractors. One case from imperial times (but from outside Asia Minor) sheds more light on this matter: a *sitones* from Sparta, who held this post three times, informs us that he travelled to Egypt in order to buy grain. He also emphasises that he managed to ship the grain home without losses.⁹⁴

Strubbe has proved that in Asia Minor the *sitonai* belonged to the highest echelons of the municipal elite. The high status of the *curatores frumenti* in Italy and the *sitonai* in the Greek East probably helped to urge local landowners to bring grain onto the market, but there is no evidence to support this assumption. It is also possible that in the face of future dearth, members of the local elite were appointed who were in a position to acquire external grain. Such seems to have been the situation in Narbonne, where, during the early Principate, M. Messius Gallus and his brother both were given the title *aedilis curator*. It has been concluded that in this case the title does not point to a permanent magistracy, but to a special post that had been created to deal with a current crisis. Interestingly, the brothers Messii were citizens of Béziers, not Narbonne, and

91 AE 1979, 434 = Dardaine and Pavis D'Escurac (1986) nr. 12. Also, p. 296.

92 Strubbe (1989) 104.

93 Cf. Wallace-Hadrill (1991) 249f: contact with the world of commerce was inevitable for the elite.

94 SEG 11.491. Quass (1993) 268.

may have been chosen because their connections in the region of Béziers offered access to grain that was easily shipped along the river Aude.⁹⁵

The status of a city and its leading citizens was of the utmost importance in gaining access to the vast resources of the emperors.⁹⁶ Three *sitonai* are known from Tralleis who imported grain from Egypt, and gratitude is expressed to the emperor Hadrian for allowing such imports. The well-known grant of grain to Ephesus may have been in response to a request from the city's grain officials as well. Cassius Dio praises Hadrian for his generosity in giving the cities of the empire public works, money or food.⁹⁷ Imperial involvement is also attested in an inscription from Concordia, in which we are told that C. Arrius Antoninus, prefect of the *aerarium Saturni* and *iuridicus* in Italia Transpadana, was sent by the emperors Marcus Aurelius and Lucius Verus to deal with the supply problems that had struck the town.⁹⁸ In general, the *Historia Augusta* informs us, 'in times of famine he [Marcus Aurelius] furnished the Italian communities with food from the city.'⁹⁹ Coins from Tarsus indicate that this city received Egyptian grain from both Caracalla and Severus Alexander.¹⁰⁰ We may add two cases in which not the emperor directly, but his provincial representatives were involved, although in neither case is mention made of a municipal request: M. Aurelius Masculus, governor of the Alpes Maritimae, offered food to Cemenelum, and Marcus Sulpicius Felix, military commander in Sala, contributed military supplies during a dearth in this African town (approximately AD 144).¹⁰¹ Such cases may indicate that, in addition to transactions with merchants and the dispersed landholdings of the municipal elite, the urban elite sometimes offered access to the resources of the imperial government.

Conclusions

Direct market intervention in the Roman world was characterised by the interconnectedness of public and private, permanent and temporary elements. The balance between these elements seems to have differed

95 Dardaine and Pavis D'Escurac (1986) 292.

96 On the role of prominent citizens in attracting the beneficence of emperors, Millar (1977) 379ff; Boatwright (2000) 204ff.

97 Cassius Dio 69.5.3.

98 CIL 5.1874. Mrozek (1994) 98.

99 *H. A., Marc.* 11.3.

100 Ziegler (1977) 34ff.

101 Cemenelum: CIL 5.7881 = Dardaine and Pavis D'Escurac (1986) nr. 4. Sala: AE 1931, 38 = *Ibid.* nr. 24. See also p. 294.

between the regions of the Roman Empire. The evidence may suggest more reliance in the western provinces on prominent citizens who occasionally and temporarily took care of the communities' food supply. In contrast, permanent institutions and regular magistracies seem to have predominated in the Greek East. In Italy and the East, permanent grain funds and regular magistrates who dealt with a community's grain supply were common, but it seems likely that this did not pertain to each and every town, some of which relied solely on private initiative and emergency measures. The care of the community's food supply was part of the social structure of the Roman town. However, the relations between urban elites and the masses did not conform to a uniform pattern throughout the Roman world, which may explain the regional differences in policy, and the probable absence of permanent mechanisms of direct market intervention in some parts of the empire.

Despite the regular intervention in the market by authorities or wealthy individuals who made grain available below market prices, most urban communities depended on the forces of the market for their sustenance. However, K.G. Persson makes the following observation regarding markets in early modern Europe: 'The near self-sufficiency of many nations under normal conditions also hampered the development of a suitably large class of merchants, in whose absence the state or a city had to act as a substitute when unexpected local harvest failures occurred.'¹⁰² The necessity for authorities to intervene directly by buying and importing grain reflects the weaknesses of the market to deal with food crises. This is true of ancient as well as early modern cities and explains the role of public institutions. On the basis of grain funds, municipal authorities participated in the market as buyers and sellers of grain. The prime purpose of grain funds was to alleviate the impact of harvest shocks by making grain available on the market, probably below market prices. This was the more necessary, since most towns and cities were largely sustained from their immediate hinterland. Public schemes functioned on the basis of the greater access by the ruling elite of towns and cities to capital, information, social networks and coercive power. It cannot be ruled out that grain funds often distributed (cheap) grain in 'normal' years. The clearest evidence of this pertains to the grain fund on Hellenistic Delos, which provided the finance for the sale of cheap grain each

102 Persson (1996) 705; (1999) 77. Likewise Reher (1990) 159 concerning central Spain: with no commercial network for agricultural products, it was impossible for grain from other regions to offset local speculation effectively.

spring in order to alleviate the impact of the pre-harvest price rises.¹⁰³ Similar measures are attested in medieval Italy. The effectiveness of grain funds against shortages was greatly hampered by the fact that harvest failures were unpredictable. Early modern grain funds therefore suffered usually from lack of adequate funding in times of dearth. Although the Roman authorities showed great concern for the financial standing of the municipal grain funds, they relied to a large degree on the private initiative of wealthy citizens. Nevertheless, grain funds were permanent institutions, which received funding more or less regularly. In addition, towns and cities used coercive means to claim a share of the locally produced crops. The operation of grain funds, moreover, should be seen in the context of various permanent and temporary measures. There appears to have been a wide range of interrelated responses to immediate shortages that included both public decrees to increase the available capital and private initiatives to contribute capital to the grain fund. In addition, merchants and landowners made grain available by offering it for sale, generally below market prices, on the urban market. Though the main purpose of grain funds was related to harvest shocks, they were not merely incidental responses to supply problems. The permanent possibility of public intervention, even if only realised in bad years, constituted a continuous and thus structural factor in the urban food market.¹⁰⁴

MARKET REGULATION AND PRICE FIXING IN THE ROMAN WORLD

Roman authorities and the imposition of prices

Rulers in the Roman world sometimes responded to dearth by imposing a price on the market by decree. A shortage in AD 19 induced the emperor Tiberius to establish a maximum price to be paid by consumers. Nero lowered the price of grain to HS 3 a *modius* after the great fire of Rome in AD 64. Finally, during a dearth, the emperor Commodus fixed the price of all kinds of foodstuffs, only to see the shortage increase, which our late

¹⁰³ Reger (1993) 320ff.

¹⁰⁴ Cf. Strubbe (1989) 118: 'In our opinion the *sitionia* was a permanent and well-developed institution, acting as a long term response to crisis, with additional social and political advantages.'

Roman source considers self-evident.¹⁰⁵ Rome may have been an exceptional case, because, as we suggest, the government's provisioning of the capital gave it a determining influence on the grain market. Each of these cases is related to immediate disturbances of supply, which shows that the government did not permanently establish the price of grain.¹⁰⁶ The emperors did not normally need to use the drastic measure of price fixing, because their control of market supply ensured them a better and more direct way to stabilise prices. However, no other city could count on such means to ensure an adequate supply.

If the system had failed and dearth struck the city, it was tempting for those in power to use their authority and simply impose a low price on the market. Stronger even: considering the widespread belief that speculative behaviour caused the disturbance of the market, the imposition of a fair price was even a natural response. According to Plato, traders were governed by nature by their greed, and hence he devised for his ideal state a special institution, in which market officials and traders determined the market price of all goods that were sold on the market. A price list was to be made public and implemented by state officials who supervised the market.¹⁰⁷ Undoubtedly, the best-known instance of price regulation is Diocletian's price edict. Fragments of the price edict have been found in many places, indicating the effort made to impose a uniform price level on all the regions of the empire. Moreover, the edict comprises an almost exhaustive list of goods and services, starting with basic foodstuffs, but also including expensive textiles and animals for the games.¹⁰⁸ Interestingly, the *praefatio* justifies the price edict by the avarice and lawlessness that governed the market. A distinction is explicitly made between a maximum and a fixed price. Imposing a fixed price, it is said, would not be justified, because some regions already had low prices:

We have decreed that there be established, not the prices of articles for sale – for such an act would be unjust when many provinces occasionally rejoice in the good fortune of wished-for low prices . . . – but a maximum, so that when the violence of high prices appears anywhere . . . avarice which, as if in immense

105 Tiberius: Tacitus, *Ann.* 2.87. Suetonius, *Tib.* 34.1, does not refer to a maximum market price of food, but to a ruling of Tiberius to curb expenditure by the rich: the senate should establish a maximum to be spent on luxuries, including food. Contra Garnsey and Van Nijf (1998) 304. Nero: Tacitus, *Ann.* 15.39.2. Cf. *Ibid.* 15.18.2. Commodus: *H. A., Comm.* 14.3.

106 Garnsey and Van Nijf (1998) 304ff. Also Garnsey (1988) 230.

107 Plato, *Laus* VI 764b; VIII 849a; IX 881c; XI 917b. Foster (1970) 129; Ten Brink (1994) 258.

108 Recently, Kuhoff (2001) 543ff; Polichetti (2002) 218ff.

open areas, could not be restrained, might be checked by the limits of our statute or by the boundaries of a regulatory law. It is our pleasure, therefore, that the prices listed in the subjoined summary be observed in the whole of our empire in such fashion that every man may know that while permission to exceed them has been forbidden him, the blessing of low prices has in no case been restricted in those places where supplies are seen to abound, since special provision is made for these when avarice is definitely quieted.¹⁰⁹

In short, as long as the market functioned well, the price was left to the forces of supply and demand, but as soon as shortages occurred, the avarice of sellers required the imposition of maximum prices. Interestingly, the distinction between fixed and maximum prices is lost in the proclamation of Fulvius Asticus, provincial governor of Phrygia and Caria, concerning Diocletian's price edict. The governor's proclamation refers to 'just prices', which are fixed by the emperor's edict for the benefit of all mankind.¹¹⁰

In view of its universality and wide range, Diocletian's price edict was clearly an exceptional measure and the explanation in the *praefatio* seems at the very least to be partial. The price edict should be understood against the background of inflation and Diocletian's response in his monetary reform.¹¹¹ Despite its exceptional scope, the edict, with its emphasis on dearth and speculation in the *praefatio*, seems to be conventionally represented as a measure aimed at curbing prices in times of crisis. However, the edict is not without parallel in later times. During a food shortage in Antioch in AD 362/3, the emperor Julian issued a price edict, which, in his own words, prevented prices of wine, vegetables and grain from rising exorbitantly.¹¹² It seems likely, however, that the edict did not concern only primary foodstuffs.¹¹³ Although Libanius does not provide any details about the price edict, he does inform us that Julian introduced this measure to an assembly of the city's landowners, craftsmen and traders, which implies that the edict applied to a wider range of goods.¹¹⁴

Also Ammianus Marcellinus refers to 'merchandise' in general (*vilitati studebat rerum venalium*).¹¹⁵ Hence, Diocletian's edict may have served as a model in later times, although in a more restricted form. However, the wording of the *praefatio* to Diocletian's edict clearly implies that also in

109 ESAR V 310ff. Freis (1994) no. 151, 15f = Lauffer (1971).

110 Crawford and Reynolds (1975) 160ff. Cf. Meissner (2000) 91ff.

111 For a different interpretation, see Meissner (2000) 86ff.

112 Julian, *Misop.* 368c ff.

113 Thus Wiemer (1995) 301ff. Otherwise, Schneider (1983) 63f.

114 Libanius, *Or.* 18.195.

115 Ammianus 22.1.4.1.

earlier times rulers had intervened in the food supply by determining the prices on the market. The question is, whether we can find the cases to which the *praefatio* implicitly refers.

One parallel may be found in the intervention by the provincial governor in the market of Pisidian Antioch in the year AD 93. We may quote almost in full the inscription, which is dedicated to Lucius Antistius Rusticus – ‘Patron of the colony, because he took excellent care of the grain supply’:

... Since the duoviri and decurions of the most splendid colony of Antioch have written to me that because of the harsh winter the market price of grain has shot up, and since they have requested that the people have the means of buying it – with good luck on our side – all those who are either citizens of the colony of Antioch or are inhabitants of it shall state openly before the duoviri of the colony of Antioch, within thirty days of the time when this edict of mine has been posted, how much grain each person has and in what place, and how much he deducts for seed or for the annual allowance of his family. The rest of the grain, the whole supply, he shall make available to the buyers of the colony of Antioch. Moreover, for the selling time I establish the next Kalends of August. ... Since, furthermore, it has been confirmed to me that, before the persistent harshness of the winter, eight or nine *asses* was the price of a *modius* of grain in the colony, and since it is most unjust for the source of anyone’s profit to be the hunger of his citizens, exceeding one *denarius* [= 16 *asses*] for one *modius* as the price of grain I forbid.¹¹⁶

The details of Antistius Rusticus’ decree are still disputed. The inscription states that the grain had to be sold to the *emptores coloniae Antiochensis*. H.-U. Wiemer has rightly pointed out that the term *emptor* excludes either magistrates (such as *sitonai*) or merchants.¹¹⁷ In view of the explicitly stated purpose of the measure – i.e. to offer the plebs an opportunity to buy – the obvious interpretation of *emptor* is that the sellers had to offer their grain directly to consumers.¹¹⁸ Wiemer, however, interprets *vendendi tempus*, which was set at the kalends of August, not as the end of the period during which the grain had to be offered for sale, but as the day on which the grain had to be sold. This also means that the maximum price was only in force on that day.¹¹⁹ According to Wiemer, the edict offered to the plebs the opportunity on this day to buy sufficient grain to take them through the next winter. This interpretation is rather problematic. Most

116 Sherk (1988) nr. 107 = AE 1925, 126 = Freis (1994) nr. 65.

117 In contrast, Herz (1988) 149 assumes that traders were meant. Garnsey (1988) ‘grain commissioner’. Ziegler (1977) 30 n. 8: *sitonai*.

118 Wiemer (1997) 203f.

119 *Ibid.* 201.

importantly, it implies that the masses of Pisidian Antioch had sufficient capital to buy grain in bulk. It is well-nigh impossible that the masses of this or any other city should have had the financial reserves to buy such an amount of grain at prices that were moreover substantially above average. Also unlikely is the implication that the plebs would have been offered an opportunity to buy after the worst period was over. It is more likely that the kalends of August ended the period during which the edict was enforced. In other words, from the publication of the edict (the date of which is unknown) until the kalends of August, the grain owners had to offer a certain part of their stores for sale at a price below 16 *asses a modius*. The plebs was thus offered an opportunity to buy grain during the most difficult period of the year. This interpretation also tallies best with the stated cause of the dearth: since the winter had been very severe, the harvest was probably late, which severely aggravated the usual pre-harvest dearth. For the same reason, the period was extended to the kalends of August, a date at which the new harvest would normally be available.

The inscription invites a few observations regarding the imposition of prices. First, the provincial governor acts in response to a request by the council of Antioch. He does not act on his own initiative. Nor is one to assume a conflict with the ruling elite of the town, or an unwillingness or inability of the latter to intervene in the present shortage.¹²⁰ While the governor lends his authority to the decree, its implementation was solely in the hands of the colony's magistrates. It seems to me hypercritical to argue that the inscription gives a totally false presentation of the council's initiative and acceptance of the decree.¹²¹ Secondly, the maximum price that the decree established was substantially higher than the price before the crisis. The decreed price may not have deviated much from free market prices.¹²² Thirdly, the governor explicitly justifies the imposition of a maximum price as a measure against the avarice of sellers, whose speculative behaviour during a dearth he condemns.

Fourthly, the edict shows that market price and supply are indissolubly connected. The imposition of a maximum price could not be effective, if the market was not sufficiently supplied. The imposition of a price on the market required additional measures that ensured a more or less adequate

120 Contra Garnsey (1988) 258.

121 Wiemer (1997) 205 points out that the title *patronus coloniae* and the monument itself show general agreement among the councillors and citizens of Antioch.

122 Kobes (1999) 82f assumes that the governor establishes a high maximum price in order not to discourage imports. However, the edict is only concerned with locally available supplies. Imports seem not to have been expected.

market supply.¹²³ Hence, the decree forced owners of grain to offer it for sale on the market, thus offering ‘the plebs an opportunity to buy’. Conversely, measures that were based on coercion to supply the market required the control of prices in order to work. The requisition of grain in Oxyrhynchus in AD 246 by the *iuridicus* Aurelius Tiberius reveals the same line of thought as the decree by Antistius Rusticus in AD 93:

All those who are holding grain in the city and in the nome are to declare it – so that the city can have its nourishment and the public necessities can be fulfilled – tomorrow, that is Phamenoth 22, without any loss to themselves, for each will receive the price which our most illustrious prefect has fixed, 6 *denarii*.¹²⁴

Already in AD 191, the landowners of Oxyrhynchus were ordered by the *praefectus Aegypti* to declare their grain within five days and to bring it up for sale in the town.¹²⁵ There would be little point to such a measure, if the sellers were allowed to ask exorbitantly high prices. In order to work, enforced sale requires the imposition of prices. Thus, we may be sure that, whenever authorities used coercion to supply the market, they somehow imposed a price on it, either by public purchase or by imposing a market price.¹²⁶

A ruling of Marcus Aurelius and Lucius Verus limited the imposition of prices:

The emperors Antoninus and Verus, Augusti, wrote a rescript in these words: ‘It is grossly unjust for the decurions to sell grain to their citizens more cheaply than the corn supply requires. The same emperors wrote in a rescript that it is not lawful for the *ordo decurionum* of any *civitas* to lay down the price of any grain which is found (*invenitur*).’¹²⁷

Let us first deal with the second half of the passage, which clearly states that a town council is not authorised to impose a price on local grain stores.¹²⁸

123 Similar, Kohns (1988) 116; Wiemer (1995) 309; Meissner (2000) 97.

124 P. Oxy. 42.3048 = Rowlandson (1998) nr. 174. As Herz (1988) 187ff points out, the price, set at 6 *denarii* per *artaba*, is very high, which may confirm that the authorities did not deviate much from market prices. Cf. Kloft (1988) 148f; Sharp (1998) 177f. Rathbone (1997) 194 points out that prices in Oxyrhynchus remained high for several years afterwards.

125 P. Oxy. 47.3349. Cf. Sharp (1998) 177; Dirscherl (1999) 86.

126 In contrast, Rathbone (1997) 193f assumes that in AD 191, unlike AD 246, prices were left to the market. He points out that the prices of 18 and 20 *dr./art.* attested in early AD 192 were not exceptionally high. A comparison to the imposition of prices on the enforced sale of grain may be found in medieval Italy. Peyer (1950) 32ff, 142.

127 Papirius Justus *Digest* 48.12.3.

128 According to Höbenreich (1997) 186 *pretium grani quod invenitur* means ‘dass die Stadträte den Preis diktiert haben, zu dem sie bereit sind, *frumentum* für die Allgemeinheit einzukaufen und bereitzustellen.’ I do not see a reason for such a limited interpretation.

There seems to be no disagreement with both cases that we have seen. In Pisidian Antioch the price was determined by the provincial governor, in Oxyrhynchus by the *praefectus Aegypti*. It seems likely that the councillors had been entitled to impose a price on private grain before the ruling, but whether they continued to have the right to enforce the sale of private stores is less clear. In any case, the rescript from the AD 160s implicitly allowed the imposition of prices on private stores, though not by town councillors.

The first ruling, however, is more difficult to interpret. The same rescript is addressed elsewhere in the *Digest*:

Antoninus and Verus issued a rescript to the effect that decurions were not to be forced to provide corn to their fellow citizens at less than the market price. This is also laid down in other imperial *constitutiones*.¹²⁹

Paulus *Digest* 50.8.7(5)pr contains a similar ruling.¹³⁰ Note that all three passages explicitly refer to grain. The imposition of prices on other goods is not mentioned in the *Digest*. The main element is clear enough: *decuriones* were not to be forced to sell grain below the current market price. However, the context of the passage, which would have clarified its meaning, has fallen victim to the abridgement by the late Roman jurists. Dardaine and Pavis D'Escurac argued that the emperors feared for the negative impact of low prices on agricultural production.¹³¹ Peter Herz assumed that the emperors wanted to prevent the councillors from getting a local monopoly on the grain market and therefore did not allow them to sell below the market price.¹³² There are some problems with this interpretation. First, it would imply the unprecedented imposition of a minimum price. Secondly, I do not understand how the *decuriones* were to achieve a monopolistic position on the grain market.

The purpose of a minimum price, one could argue, was to protect the interests of the lesser *decuriones* against the activities of large landowners who wanted to gain popularity by selling their crops at low prices. However, what circumstances are we to envision? Selling grain below market prices in times of dearth? That is hardly possible, since many inscriptions praise wealthy citizens for such acts of beneficence. The alternative is that the interests of lesser landowners had to be protected

129 Marcianus *Digest* 50.1.8.

130 'Decurions may not be forced to provide corn at a price cheaper than the price of corn at the time in their *patria*.'

131 Dardaine and Pavis D'Escurac (1986) 297f.

132 Herz (1988) 148f. Cf. De Ligt (2002) 16 n. 58.

by enforcing a minimum price in normal years. However, it is not very likely that this was the prime purpose of the ruling, since it deals solely with grain. The interests of commercial farmers, however, would have been served more by laws that imposed a minimum price on olive oil or wine, which were more profitable goods in abundant harvest years than grain. However, no such ruling is mentioned in the *Digest*. The fact that all rulings deal exclusively with grain shows that these are measures that focus on the consumer, not the producer. The point seems to be that the emperors ruled that such local measures should not be at the cost of the *ordo decurionum*.

Hence, we should conclude that the *decuriones* were allowed to sell at as low a price as they liked, but, as Marcianus *Digest* 50.1.8 and Paulus *Digest* 50.8.7(5)pr clearly state, that they were not to be *forced* to do so. The problem is: forced by whom? Are we to assume that the *decuriones* were exempt from the decrees ordered by the Roman authorities? That is not impossible, but seems unlikely. The possibility that the citizenry (or part of them – rioters?) are intended may also be ruled out, since it was self-evident that councillors could not be forced by the urban populace. Rather, the councillors or urban magistrates themselves are meant. Thus, urban magistrates or the town council were not authorised to force individual *decuriones* to sell grain below the market price. What could be the reason behind the ruling?¹³³ Most likely is that the emperors wanted to curb the tendency of town councils to take costly measures that would ruin the financial standing of the *ordo decurionum*. The widening gulf that separated the wealthiest members of the curial class from ordinary *decuriones*, who increasingly experienced difficulties in meeting their liturgical obligations, may be seen as the background of the imperial policy.¹³⁴ There are many examples of such a policy from the second half of the second century.¹³⁵ An important case in point is the fact that the *curatores rei publicae* supervised the municipal grain funds.¹³⁶ In sum, the rulings of Marcus Aurelius and other emperors limited the authorisation of councillors to regulate the grain market by the imposition of prices.

133 Cf. Höbenreich (1997) 178ff, who argues, first, that it must remain unclear who puts pressure on the *decuriones*, secondly, that the emperors tried to protect the councillors from additional cost, in view of the increasing avoidance of the *ordo decurionum* among the rich.

134 Alföldy (1984) 112. On the burden of municipal offices, Duncan-Jones (1990) 163ff. See for the point of view of the Greek elite, Grassl (1982) 29ff.

135 Eck (1979) 196f. Cf. Boatwright (2000) 73ff on the *curatores rei publicae*.

136 Ulpianus *Digest* 50.8.2.4.

The ruling of Marcus Aurelius indicates that the imposition of prices took place, although the emperors suppressed the unwanted aspects of such local policies. Few cases, however, are known for the first three centuries AD. In contrast, we find a series of such measures within a short period in Syrian Antioch during the fourth century.¹³⁷ In AD 354, the Caesar Gallus decreed low prices on the market of Antioch. In the face of vehement opposition by the senate of Antioch, who rejected his imposition of cheap prices 'at an unseasonable time', he ordered the death of their leaders.¹³⁸ When the emperor Julian visited Antioch in AD 362/3, he was confronted with the outcry of the populace, who demanded that measures were taken to deal with the present shortage. According to his own account, Julian responded in the expected manner: he urged the rich to supply the market, but to no avail. He then fixed 'a fair price' for all goods and had tax-corn imported from Egypt and neighbouring regions. The emperor Julian justified his measure by the avarice of those supplying the market. Moreover, Julian backed up his maximum price by providing the market with grain that he had acquired through taxation and enforced purchases. However, the measure failed and a conflict ensued between the councillors and the emperor. According to Libanius, the failure was due to the fact that market supply dried up because of the imposition of low prices.¹³⁹ Finally, in AD 384, dearth struck the city again, and the populace demanded from the *comes Orientis* Icarius, who resided in the city, that he fix the price of bread. Libanius strongly but unsuccessfully opposed the measure. Icarius imposed prices on the market, but, if we are to believe Libanius, who is no impartial witness, the measure failed and was soon lifted. Nevertheless, Icarius repeated and even expanded the measure, when in AD 385 the dearth continued.¹⁴⁰

Antioch during the second half of the fourth century happens to be well documented by Julian's own writings, the historical work of Ammianus Marcellinus and the letters and orations of Libanius. The three cases in Antioch may reflect a similar situation in other cities in the fourth century. It is possible that, as in Antioch, the imperial rulers and their representatives were more willing in the fourth century than previously to

137 In general, Liebeschuetz (1972) 127ff; Schneider (1983) 62ff; Wiemer (1995) 269ff; (1996) 527ff. The factors that underlie the repeated food crises in Antioch are discussed in Burgess (1998) 297f. Cf. Woods (2001) 236f.

138 Ammianus 14.7.2–8. Cf. Libanius, *Or.* 1.96–7; 14.47.

139 Libanius, *Or.* 15; Julian, *Misop.* 368c ff; Ammianus 22.14.1f. The various sources and their perspective are discussed in Wiemer (1995) 269ff.

140 Libanius, *Or.* 1.205ff, 226ff, 27.3ff, 29.2ff.

intervene with drastic measures in local markets. However, the series of events in Antioch may also be exceptional and we should probably not conclude that the imposition of prices was a common event in the fourth century. Gallus, Julian and Icarus were present when dearth struck the city, and responded to violent conflicts between the urban populace and the local authorities. Conversely, as soon as the emperor and his representatives had left Antioch, the council abolished Julian's price edict.¹⁴¹ As Garnsey and Whittaker point out: 'Without a *deus ex machina* . . . the mass of the cities of the empire had to fall back on themselves and their own resources.'¹⁴² When present, Roman rulers were pressed to take measures. In AD 382 the *comes Orientis* Philagrius was attacked by the angry masses, and he could only save his skin by publicly flogging the bakers.¹⁴³ In AD 384, the populace demanded specifically the imposition of a fixed price, which may have been due to the fact that within their lifetime prices had been fixed twice already. Once the urban consumers became used to imperial intervention, it became impossible for the authorities not to intervene.

The response by the urban elite indicates that the imposition of prices by the authorities was neither the order of the day nor an abnormal response to dearth. The urban elite vehemently opposed the measures that were forced upon them by the representatives of the central government. This seems to have been a general attitude of the elites, though not of the common people. Lactantius stated that in response to Diocletian's price edict, market supply dried up.¹⁴⁴ The fourth-century author of the *Historia Augusta* mentions that Commodus 'ordered a general reduction of prices, the result of which was an even greater scarcity'.¹⁴⁵ Libanius makes the same point.¹⁴⁶ Ammianus Marcellinus – contemporary and admirer of Julian – remarked on price fixing, 'when this matter is not properly regulated, it is wont to cause scarcity and famine'.¹⁴⁷ However, none of these authors remarks that price fixing was unprecedented or

141 Libanius, *Ep.* 1379.2f. Wiemer (1995) 312ff.

142 Garnsey and Whittaker (1998) 329f. One may also point to the intervention of the proconsul Hymetius during a shortage in Carthage: he sold grain from the public granaries at 10 *modii* to the *solidus* and bought it back at 30 *modii/solidus*. Ammianus 28.1.17–18. On prices in the late Roman Empire, Mayerson (1995) 443ff.

143 Libanius, *Or.* 1.207ff. Wiemer (1996) 531f.

144 Lactantius, *De mort. pers.* 7.6f. On this passage, Meissner (2000) 78f, 100.

145 *H. A., Comm.* 14.3.

146 On the attitude of Libanius and the councillors of Antioch, Wiemer (1995) 317ff.

147 Ammianus 22.14.1. Schneider (1983) 65.

exceptional. Ammianus Marcellinus' observation even implies many failed attempts to regulate prices.

The elite's emphatic opposition to price fixing may explain why the imposition of maximum or fixed prices was not a very common response to dearth in the Roman world. The reasons may be twofold: self-interest and inefficiency. Contemporary writers realised that the success of price regulation largely depended on the circumstances. As we have argued, price regulation was indissolubly connected to market supply. As long as demand could not be met by a reasonably adequate supply, there was little point in imposing prices. Most towns or cities did not have the means to arrange additional supplies to back up price regulation. They largely relied on the supply from their immediate hinterland. If local harvests failed, additional supplies from outside would have been welcome, but the imposition of a maximum or fixed price was counterproductive if imports were needed.¹⁴⁸ Even in bad years, however, supplies were largely local. No mention is made in Pisidian Antioch or Oxyrhynchus of external supplies.¹⁴⁹ Antioch generally depended on its own hinterland, and also during the crisis of AD 362/3, the only imports that arrived in the city originated in the emperor's intervention. The measures that were taken were aimed solely at local food reserves. Also in early modern Europe, small towns lacked the power to attract outside grain. Hence, the strongest internal measure that municipal authorities could take in times of dearth was the requisitioning of grain.¹⁵⁰ In both cases, the main intention was to supply the market by political pressure. The imposition of a fixed price was needed to make it work. We should also note that the maximum price imposed in Pisidian Antioch need not have deviated much from free market prices. Nevertheless, the imposition of a maximum price meant a financial loss – or rather, it meant lower profits to local landowners in times of dearth. Julian and Libanius agree that the opposition of the councillors was mainly due to the fact that they profited from the trade in grain.¹⁵¹ Because the income of the urban elites derived largely from their estates, loss of income may explain why many councillors

148 Thus, amongst others, Kohns (1988) 115.

149 See in comparison Reher (1990) 159 on central Spain: with the exception of Madrid, until well into the 19th century imported grain rarely if ever effectively mitigated periods of dearth in the interior.

150 Thus Reher (1990) 161, who points out that in Cuenca (Castile) as early as the 16th century royal decrees existed which obliged individuals and even the Church to sell excess grain at reasonable prices to the town.

151 Julian, *Misop.* 350A; Libanius, *Or.* 18.195ff. Cf. Liebeschuetz (1972) 131; Schneider (1983) 64.

did not welcome a maximum price that would limit their opportunity to profit from harvest shocks, the more so, as cereal cultivation was most profitable in bad harvest years.

While the burden of local office-holding gradually increased, the social and political competition within the towns and the elite's attitude towards their obligations within the community had changed by the fourth century in comparison to the first or second centuries. This is also observed by H.-U. Wiemer in his analysis of the relationship between the councillors of Antioch and Julian during the crisis that struck the city in AD 362/3. We may hypothesise that elite competition and obligation had largely disappeared, thus removing the incentives for measures the costs of which they had to bear themselves.

Bakers and the price of bread

Two problems were attached to the imposition of fixed or maximum prices on the grain market: low prices hampered the availability of external supplies, while they diminished the opportunity for profit for local producers, amongst which the urban elite figured prominently. As far as the regulation of prices on the market could get around these consequences, the authorities were perfectly willing to oppose high prices on the urban market.¹⁵² One modern scholar observes: 'the realities of the market thus restricted the scope for the effective price-regulation of the private grain trade, but this meant even more intervention in the milling and baking process in the interest of consumers.'¹⁵³ This observation is made regarding medieval Italy, but it applies just as well to antiquity. In other words, the regulation of prices mainly functioned on the level of the retail trade and consumer market, while it left the wholesale trade largely to the forces of supply and demand.¹⁵⁴ It might be objected that the difference between wholesale and retail trade was in practice impossible to make (for ancient authorities as much as for modern historians). However, one should realise that such a distinction was made possible by the fact that urban consumers depended on bakers for their supply of bread.

152 Wiemer (1996) 530 points out regarding the events in Antioch in AD 362/3 that the price of bread was subject to Julian's maximum price, while the price paid to the landowners for the grain remained high.

153 Peyer (1950) 143: 'Waren auf diese Weise durch die tatsächlichen Gegebenheiten einer wirksamen Preisregelung im privaten Getreidehandel ziemlich enge Grenzen gesetzt, so versuchte man im Interesse der Konsumenten beim Mahlen und Backen um so schärfer einzugreifen.'

154 Regarding Classical Greece, cf. Migeotte (1997) 33f.

The separation of measures concerning the wholesale and retail trade limited the scope for regulation of consumer prices: when the price of grain on the wholesale market was high, these costs had to be borne either by consumers or by the retail traders and bakers. Maximum prices imposed on the retail trade meant that the costs of high wholesale prices were shifted onto the urban bakers and traders. Such is the complaint made by the bakers of Antioch in AD 362/3: they had to pay high prices, but as a result of Julian's imposition of maximum prices they could not pass their increased expenses to the consumers.¹⁵⁵ Hence, the scope for price regulation of the consumer market was probably very limited.

In order to clarify the distinction in price policy between the wholesale and retail trade, a brief digression outside our chronological boundaries may be allowed. More than any other Classical Greek city, fourth-century Athens had to rely on the market and overseas shipments to sustain its large population.¹⁵⁶ Hence, every month, the city's food supply was on the agenda of the Athenian assembly.¹⁵⁷ A number of rules controlled the workings of the market. Profits were regulated to ensure, in the words of Aristotle, 'a just price':

Their [i.e. the *sitophylakes*'] duties are first to see that unground corn in the market is on sale at a fair price, and next that millers sell barley meal at a price corresponding with that of barley, and bakers loaves at a price corresponding with that of wheat, and weighing the amount fixed by the officials – for the law orders that these shall fix the weights.¹⁵⁸

Athenian magistrates did not fix the prices of flour and bread, but these were tied to current market prices of grain. Athenian lawgivers seem to have realised that grain prices could not be fixed without endangering market supply. Although the primary goal of all regulations in Athens was to ensure a low level of food prices and to limit price volatility, Athenian lawgivers did not attempt to impose prices on the market. The government intervened intentionally to ensure a stable grain supply and to lessen price volatility on the food market, but in the end the market price of grain was largely left to the commercial forces of supply and demand.

155 Julian, *Misop.* 350A.

156 Xenophon, *Hell.* 6.1.11; Demosthenes 18.87; 20.30. See Garnsey and Rathbone (1985); Garnsey (1988) 89ff; Figueira (1986) 149–71; Osborne (1987) 97ff; Keen (1993); Migeotte (1997) 35ff; Whitby (1998) 102–28; Engels (2000) 97–124; Rosivach (2000) 31–62.

157 Aristotle, *Ath. Pol.* 43.4.

158 *Ibid.* 51.3. Cf. Figueira (1986) 151f; Migeotte (1997) 34; Rosivach (2000) 48ff.

Nevertheless, their measures limited the opportunities for traders, millers and bakers to make large profits at the consumer's expense.¹⁵⁹

In Roman times, urban officials such as *agoranomoi* and *aediles* were responsible for market conditions, and thus also for market prices. An inscription from Pergamon containing an edict concerning the exchange of money and dating to the first half of the second century AD mentions foodstuffs that were sold on the consumer market. Interestingly, the text refers to prices that were determined or estimated by the *agoranomoi*: 'When foodstuffs are sold on the retail market according to weight and their value was assessed by the *agoranomoi* . . .' The exact interpretation, however, is uncertain.¹⁶⁰ The novelist Apuleius provides an interesting parallel example of price control in his *Metamorphoses* when the main character, Lucius, buys fish on the market and his friend Pytheas, who happens to be *agoranomos*, finds out at what price. The *agoranomos* takes the fish, reproaches the fishmonger for selling at exorbitant prices and orders his assistant to destroy the fishmonger's merchandise. Lucius ends up with having paid too much, but still having no fish. While this story pokes fun at the rather too diligent magistrate, it implies a continuous, but arbitrary supervision of market prices.¹⁶¹ One is reminded of a story about an *agoranomos* in Roman Palestine who starts to inspect the shopkeepers' measures, but finds that they close their shops in order to avoid inspection. The *agoranomos* 'seized the first one and beat him, and the others, on hearing this, opened their shops of their own accord.'¹⁶² The *Digest* shows that such treatment of petty traders was not an exceptional case.¹⁶³

The threat of violence against traders is also attested by Libanius in a letter to the *consularis Syriae* Alexander.¹⁶⁴ This letter shows that Alexander had installed a commission, whose task was to investigate whether the traders (*kapēloi*) of Antioch had adhered to the maximum prices decreed by the emperor Julian during the crisis of AD 362/3. Not satisfied with the co-operation of the traders, who pleaded that they did not keep accounts that could be checked, the commission threatened them with violence. In

159 Cf. Figueira (1986) 166ff; Rosivach (2000) 52ff.

160 OGIS 484 = Freis (1994) nr. 87.

161 Apuleius, *Metam.* 1.24f.

162 Yalkut Shimoni, Hukkat 763. Quoted from Sperber (1977b) 229; (1998) 33. The control of measures, although in a friendlier way, is also implied in the gift of *mensurae publicae* by the *aediles* to their communities. Wesch-Klein (1989) 30f.

163 *Digest* 18.6.13; 19.2.13.8. Plautus, *Capt.* 807ff offers a parody of a magistrate's proclamation concerning the food trade, similarly threatening violence.

164 Libanius, *Ep.* 1406. Wiemer (1995) 314f, 323f. For more examples of official mistreatment of bakers and petty traders in the works of Libanius, *ibid.* p. 323 n. 317.

response, the traders warned that they would leave the city altogether. Hence, Libanius wrote his letter to the *consularis Syriae*, asking him to dismiss the commission that he had installed. The fact that a commission had to be installed to supervise compliance with Julian's edict might imply that normally there were no officials in Antioch who dealt with price control. It is more likely, however, that the *consularis Syriae* did not trust the council of Antioch to take the appropriate measures and thus installed a commission himself. There was good cause to distrust the council in this matter, since the councillors had opposed Julian's measure from the start and abolished it as soon as he and his representatives had left the city.

A series of price declarations from fourth-century Egypt may offer insight into the supervision of retail prices by the responsible magistrates. Documents have been found in which representatives of various guilds of dealers of foodstuffs inform the *logistes* of Oxyrhynchus of the prices of goods that had been handled during the previous month.¹⁶⁵ The guilds that are mentioned include those of bakers, wine dealers, salt merchants, various kinds of butchers, and fish sellers. Since the guild representatives are able to give just one price for each item, the price declarations reflect some price agreement imposed by the guilds. Sharp observes: 'Since in all certain cases the substances declared were the raw material(s) of the guild concerned, the prices declared cannot have represented the end-prices to the consumer.'¹⁶⁶ Sharp suggests that it may imply that the guilds set a minimum price at which the members sold their products on the market. However, the fact that the declarations were made monthly to the *logistes*, who was the Egyptian equivalent of the *aedilis* or *agoranomos*, may in addition point in a different direction. If wholesale prices were left to the workings of the market, while the profit margin of urban dealers was closely supervised, the monthly price declarations offered precisely the documents that the officials needed to control the prices on the urban retail market.

On some occasions, the responsibility for the price level led to the determination of food prices by decree, for example during festivals and fairs, when large crowds of consumers gathered. Such measures were supplemented by tax exemption to suppliers, by which a sufficient market

165 References in Sharp (1998) 145f; Alston (2002) 275.

166 Sharp (1998) 145. Cf. Bowman (1986) 112f; Van Nijf (1997) 13f. In contrast, Bagnall (2000) 89f interprets these documents as instances of ancient 'statistics', without direct bureaucratic purpose.

supply for the duration of the festivities was ensured. In their discussion of prices fixed by the *agoranomoi* of the city of Ephesus, Garnsey and Van Nijf observe that the price of a loaf of bread was fairly constant, while the weight varied. They rightly conclude from this feature that in Ephesus, just as in Athens, the price of a loaf of bread was regulated by varying its weight.¹⁶⁷ However, Garnsey and Van Nijf argue that price regulation was invariably an exceptional measure.¹⁶⁸ Hence, they interpret the price regulation by the *agoranomoi* of Ephesus not as a general imposition of prices of basic foodstuffs, but as a measure strictly confined to the context of urban festivals. They point out that some of the types of bread that are mentioned in the inscriptions of the *agoranomoi* were beyond the means of ordinary citizens. Hence, the intention of the *agoranomoi* primarily was to make available for the duration of the festival the better kinds of bread at a price that was affordable to the common people. There are several parallel cases of price fixing of more or less luxurious foodstuffs, including in particular fish.¹⁶⁹ Garnsey and Van Nijf seem right in their analysis of the price regulation by *agoranomoi* in imperial Ephesus as a case of euergetism rather than as a response to the weaknesses of the market. In this case, municipal magistrates, especially those responsible for festivals, made an extra effort to ensure low prices of extraordinary foodstuffs on special occasions. However, this does not rule out that urban officials also regulated the prices of ordinary foodstuffs under normal conditions.

Petronius' *Satyricon* provides us with an interesting parallel. One of the characters in this satire, Ganymedes, is made to exclaim:

You go talking about things which are neither in heaven nor earth, and the whole time none of you care how the price of food pinches. I swear I cannot get hold of a mouthful of bread today. And how the drought goes on. There has been a famine for a whole year now. Damn the magistrates, who play 'Scratch my back, and I'll scratch yours' in league with the bakers. So the little people come off badly; for the jaws of the upper classes are always keeping carnival. I do wish we had the fellows I found here when I first came out of Asia. . . . I remember Safinius . . . You could trust him . . . So at that time food was dirt-cheap. Buying a loaf of bread for an as, it took more than two to eat it. One sees an ox's eye bigger now!¹⁷⁰

167 Garnsey and Van Nijf (1998) 311f; Van Nijf (1998) 327. Cf. Quass (1993) 264; Migeotte (1997) 35.

168 Garnsey and Van Nijf (1998) 303ff argue that there is no evidence for permanent price fixing by the *agoranomoi* for the years between 200 BC and AD 200. Cf. Van Nijf (1998) 323. Likewise Sperber (1998) 32ff regarding the early Principate.

169 Van Nijf (1998) 332. Cf. Migeotte (1997) 40ff. See SEG 47.196 for an *agoranomos* inscription with a list of prices of meat.

170 Petronius, *Sat.* 44.

The novel is set in southern Italy in Petronius' own time, i.e. mid-first century AD. Clearly, Petronius seems to refer to price fixing by way of establishing the weight of bread. The price seems to have been fixed continuously: when a man like Safinius had been *aedilis*, a small sum bought a large loaf of bread; during the present shortage, it is smaller than the eye of an ox. Obviously, the bakers were instrumental in fixing the weight of a loaf of bread, but, as Ganymedes complains, nowadays, *aediles* are in league with the bakers. Contemporary graffiti in Pompeii reveal the close connection between *aediles* and bakers: 'Please elect Gaius Iulius Polybius *aedilis*. He has good bread.'¹⁷¹ The weight/price ratio of bread may have been based on current market prices of grain, as it was in Athens, but we have no evidence to confirm this hypothesis.

A papyrus from Oxyrhynchus dating to the year AD 116 also indicates that the weight of bread was imposed on the bakers. It appears that the *agoranomos* supplied grain to the bakers of the town at a fixed price. The bakers agree to process the grain and to bake 30 loaves for each *artaba*.¹⁷² This case confirms the close relationship between *aediles/agoranomoi* and bakers, but it remains unclear if urban officials in other towns as well supplied grain to bakers.¹⁷³ An inscription honouring officials from the Boeotian city of Akraiphia offers further attestation of the supply of grain by market officials to bakers. The decree praises these magistrates for their efforts to stabilise prices on the urban market in a time of dearth:

In addition they took on the agoranomy and responsibility for the oil supply, and to the traders, butchers and bakers, who used to provide the city with their services in a disorderly manner, they offered assistance at their own expense, by giving grain to the bakers, and to the others they advanced money to use for a year without interest, as a result of which we had unfailing low prices.¹⁷⁴

The actions of these officials were exceptional, since they paid for these measures from their own pockets. Nevertheless, an agreement must have been made with the bakers, butchers and other traders concerning the prices at which they sold their produce to consumers. Thus, the inscription from Boeotia confirms a policy of regulating price levels on the urban market by way of bakers and other retail traders.

In addition, the role of bakers in the supply system of the city may explain events in Ephesus in the late second century AD, when the conduct of the bakers led to unrest among the populace. All our information we

171 CIL 4.429.

172 P.Oxy. 12.1454. Herz (1988) 78; Sharp (1998) 154f.

173 As we have argued in the [previous section](#), this seems to have been the case in Rome itself.

174 OMS 1, 279–93, ll. 53–61. Quoted from Van Nijf (1997) 93 n. 101. See also Quass (1993) 260f.

owe to the inscription that made public the decision of the provincial governor in this matter. Despite their behaviour, the bakers were not punished, the governor says, because that would not be in the city's interest. What exactly had incited the populace to riot, remains in the dark. However, it seems likely that the bakers' disregard for market regulations caused rioting of sufficient scale to warrant the intervention of the provincial governor in this urban conflict. The governor ordered them to adhere to the city's regulation, which had been proclaimed for 'the common good', and admonished them to bake sufficient bread for the city's needs.¹⁷⁵ Also in fourth-century Antioch, the burden of price control was more and more shifted to the bakers, which depressed the social and economic position of the bakers and caused severe conflicts with the municipal authorities.¹⁷⁶

We have seen several cases in which the municipal price policy did not target the price of grain, but rather the price of bread. Moreover, in some cases the regulation of the bread market was based on a fixed price but varied weight of bread. While the evidence concerning the price regulation in Ephesus may pertain to extraordinary measures relating to public festivities, the measures in Athens and southern Italy were permanent.

The price regulation in all three cases resembles closely the system for the regulation of the price of bread that was imposed on almost every town of early modern Europe.¹⁷⁷ Throughout Europe the so-called assize of bread functioned along similar lines: the price of bread was held constant, while its weight varied in accordance with the market price of grain. Interestingly, the assize of bread is already attested in the eighth century, if indeed a capitulary of the year 744 implies that not the price of bread, but its size had to be adjusted to the 'abundance of the time' (*habundantia temporis*).¹⁷⁸ More details are known for thirteenth-century Italy, which have led some scholars to believe in a Roman origin of the Italian assize of bread.¹⁷⁹ The uniformity of the system throughout Europe is surely to be explained by the conditions that governed its operation in all pre-industrial societies: the lack of control of the whole-sale market forced authorities to adopt a system that would achieve some degree of price stability for urban consumers. The bakers became pivotal in all these systems for two reasons. First, a policy that used bakers for its

175 *Inscr. Magn.* 114 = SEG 4.512 = Freis (1994) nr. 112.

176 Schneider (1983) 69f; Wiemer (1996) esp. 546ff; Van Nijf (1997) 97f.

177 On the assize of bread, Peyer (1950) 145; Löwe (1986) 306; Persson (1996) 706ff; (1999) 78ff.

178 Cahn (1969) 36.

179 Peyer (1950) 147.

implementation easily reached most consumers, because the urban populace did not mill and bake themselves, but depended on bakers.¹⁸⁰ Secondly, unlike external farmers and wholesale merchants, bakers could not easily transfer their trade elsewhere.

There were several reasons for urban magistrates to establish the weight of bread rather than its price. Firstly, reductions in weight were less obvious to the public and thus less sensitive than price rises. Secondly, as Garnsey and Van Nijf point out, a lack of sufficiently small coins made it difficult to make small changes in prices. Similarly, grain purchases in Egypt may often have been made in round figures, representing coins of large denominations, rather than in multiples of the standard unit of measurement.¹⁸¹ Finally, an important reason may have been that reducing the weight of loaves was a way of rationing existing stocks of corn. For example, during a dearth in AD 6 in Rome, 'ex-consuls were appointed to have oversight over the grain and bread supplies, so that only a fixed quantity should be sold to each person.'¹⁸² Similarly, during a dearth in Antioch, the inhabitants of the countryside were allowed to take only two loaves of bread out of the city.¹⁸³ These basic elements explain the uniformity of the assize of bread in early modern Europe as well as the similarity to the systems that are attested in antiquity.

The early modern parallel also shows that the system either required the provisioning of cheap public (or privately funded) grain to the bakers, or transferred the costs of price reduction onto the bakers (or a combination of both). However, most towns did not have access to sufficient amounts of grain to take over a substantial part of the grain supply of the urban populace. In the face of famine, many early modern towns subsidised the grain price, but at a considerable financial cost. As we have seen, the supply of the Roman bakers by the papal *annona* seems to have been an exception that was beyond the political power and financial means of the average small town. In most early modern towns, therefore, the costs in times of high grain prices were largely borne by the guild of bakers. In order to maintain the financial solvency of the bakers, the magistrates allowed the bakers a high margin of profit in normal years. In early modern Europe, bakers tended to be businessmen of substantial means.

180 Ben-David (1974) 186 points out that the sources only mention a flour market, but no grain market in Jerusalem.

181 Rathbone (1997) 196. Similarly, the price of commodities in Hellenistic Babylonia was expressed in the amount one shekel could buy. Van der Spek (2000b) 293.

182 Cassius Dio 55.26.2.

183 Libanius, *Or.* 27.14.

It may be noted that we know of a few examples of rich bakers in the Roman world too, although it is difficult to generalise on the basis of these few cases.¹⁸⁴ Early modern authorities preferred rich bakers, because they shifted a large part of the burden of price reduction onto them. Nevertheless, a substantial and prolonged reduction of the bread price in relation to the grain price was beyond the means of even the wealthiest baker. Hence, in the long term the price of bread deviated only slightly from the market price of grain. It has been estimated, for instance, that the governmental regulation of prices reduced the degree of price volatility of bread in the city of Cologne by only 25 per cent in comparison to the wholesale trade of grain.¹⁸⁵ Although the impact of urban policy in times of crisis was very welcome, its overall impact should not be overestimated. The volatility of wholesale grain prices, which remained largely beyond the control of the grain officials of the average early modern town, imposed a large degree of volatility on bread prices.¹⁸⁶ This fact should also be kept in mind when considering price regulation in the Roman world.

The agoranomos and the imposition of prices in Roman Palestine

However, it has recently been argued that in Roman Palestine the prices were strictly regulated, including the wholesale prices. The evidence on price regulation in Roman Palestine, which mostly derives from the writings of the so-called sages, has recently been analysed by Ben-Zion Rosenfeld and Joseph Menirav. The Jewish sources reveal the existence of the so-called *sha'ar*, i.e. a fixed price on transactions of agricultural and manufactured goods. The authors point to the evidence of price control by market officials in Roman times and imply that the *sha'ar* was the price implemented by the *agoranomoi*.¹⁸⁷ Rosenfeld and Menirav point out that the Mishnah refers to a 'high *sha'ar*' or a 'low *sha'ar*', and to changes of the *sha'ar*. Apparently, the *sha'ar* fluctuated according to periodic changes of the market. The frequency of such adjustments is not attested.¹⁸⁸ Moreover, the *sha'ar* was established in various towns independently. There was no 'national' *sha'ar*. Rosenfeld and Menirav conclude that the *sha'ar* 'was fixed according to supply and demand in the great markets

184 Apart from Eurysaces in Rome, Van Nijf (1997) 21f mentions a councillor in Korykos and a member of the gerousia in Ephesus.

185 Persson (1996) 706ff.

186 Löwe (1986) 306f.

187 On price control by market officials, see Ben-David (1974) 214ff; Safrai (1994) 58ff.

188 Rosenfeld and Menirav (2001) 357ff.

of the main cities, or at fairs, so the *sha'ar* fluctuated, perhaps even from day to day. This *sha'ar* was binding on all first-hand transactions carried out in the towns and villages neighbouring the central market that fixed it, up to the limit of influence of the next major city and subject to the availability of information concerning the latest *sha'ar*.¹⁸⁹

Rosenfeld and Menirav argue that the *sha'ar* governed the entire trade in agricultural produce, but there is little evidence to attest its widespread implementation. It is stated in the Mishnah that 'one may not bargain for produce until the market price has gone out'.¹⁹⁰ The context of this and similar passages makes clear that the ruling should be understood in relation to Jewish laws concerning 'usury'.¹⁹¹ The advance sale of agricultural produce was subjected to strict regulations in order to avoid usury: a buyer and a seller were only allowed to strike a bargain when the market price of the product was known. The authors agree that this type of transaction was less common than the 'cash and carry' type of transaction. It might be argued, they write, that the *sha'ar* only determined the price in advance sales. Their argument against this hypothesis is that the *sha'ar* also pertained in the retail trade. If the *sha'ar* was imposed on the retail trade, it cannot have been limited to advance sales. Even if this were true, one could argue that the *sha'ar* only pertained to the wholesale trade in the specific case of advance sale, because in this type of transaction 'usury' was to be avoided. Therefore, it is not at all clear that the wholesale trade in Roman Palestine in its entirety was governed by a fixed price.

There are, moreover, some problems with the assumption that a fixed price of the kind described by Rosenfeld and Menirav was imposed on the retail market in the towns and cities of Roman Palestine. The passage offered by Rosenfeld and Menirav as evidence of the application of the *sha'ar* to the retail market is rather weak. The Mishnah informs us of a dispute between R. Yehuda and the sages concerning the question whether a shopkeeper was allowed to sell his goods below the *sha'ar*, and the conclusion was that the shopkeeper must not do so. It seems to have been controversial whether the *sha'ar* operated as a fixed or as a maximum price. According to the decision, the *sha'ar* was a fixed price, but the dispute in itself is telling about its implementation.¹⁹² The *sha'ar*

189 *Ibid.* 358f.

190 Mishnah, Baba Mes'i'a 5:7. Quoted from Rosenfeld and Menirav (2001) 355. Cf. Neusner (1990) 108.

191 See in particular, Neusner (1990) 100ff.

192 The significance of this point is missed by Rosenfeld and Menirav (2001) 357, who use the passage merely to show that the *sha'ar* dealt also with the retail trade.

seems to have been primarily a religious rule, with little relevance to the non-Jews in the towns and cities of Roman Palestine. During the third and sixth year of the Jewish seven-year cycle, for instance, farmers had to consume a fixed part of their crop in the city of Jerusalem. If they lived more than a day's distance of Jerusalem, they were allowed to sell this part of their crop and buy its equivalent in Jerusalem.¹⁹³ Rosenfeld and Menirav point to a ruling that in such a case the farmer could buy grain at the price determined by the *sha'ar* of his home district.¹⁹⁴ However, this ruling applied only to the specific context of the second tithe. As Z. Safrai points out, 'the public at large did not obey the rabbis.' They 'did not observe the laws of purification and did not practice tithing'.¹⁹⁵ Even among Jews, the observance of the *sha'ar* is questionable.

Moreover, there is nothing to connect the *sha'ar* to urban market officials. Rosenfeld and Menirav assume that the *sha'ar* applied to transactions in the countryside, but they admit that there is no evidence that the market officials operated outside the towns and cities.¹⁹⁶ A remark in the Tosefta on the situation prior to the destruction of the Second Temple in AD 70 implies the supervision of prices by the Jewish market officials (*igranamin*, which derived from the Greek *agoranomoi*) in later times. It is said about the early period, 'there were *igranamin* in Jerusalem, and they were not appointed to control prices, but only measures.'¹⁹⁷ In contrast, it is explicitly said in third century texts that *agardemin* [= *igranamin*] were appointed in order to control measures and prices.¹⁹⁸

In view of the religious nature of the *sha'ar*, the observation in one of the Jewish writings that 'it was a non-Jewish *agoranomos* who forced him to sell cheaply' is particularly revealing.¹⁹⁹ The permanent implementation of a fixed price is most clearly ruled out by a text saying that the councillors of a particular town 'strike every twelve months and say: "sell

193 Neusner (1990) 116f, 126; Safrai (1994) 378. David Noy reminded me that Jews were not even allowed to enter Jerusalem after the Bar Kochba Revolt, which shows the theoretical nature of these rulings.

194 Rosenfeld and Menirav (2001) 363.

195 Safrai (1994) 5, 11. Hence, Neusner (1990) studies the Mishnah as an economic construct, as a statement of Judaism, not as a source of economic reality. He even goes so far as to say that the Mishnah does not 'tell us anything at all about the economy of the Jews in the time of the Mishnah' (p. 13), although in practice his position is less extreme. Cf. p. 138: the Mishnah contains 'very little material that alleges a picture of how things actually were'.

196 Rosenfeld and Menirav (2001) 365.

197 Tosefta, Bava Mezia 6.14. Quoted from Sperber (1977b) 232.

198 Sperber (1977b) 233f. A different interpretation in Ben-David (1974) 215.

199 Quoted from Safrai (1994) 318. The fact that wine became impure when an *agoranomos* had inspected it shows that such officials generally were non-Jews. Examples discussed in Sperber (1977b) 235f.

at a cheap price, sell at a cheap price.”²⁰⁰ If a fixed price was permanently imposed on the urban retail market, such an appeal would not have been necessary. One final example may be given that seems to rule out price fixing. The Mishnah contains the following ruling: ‘They do not decree a fast for the community in the first instance for a Thursday so as not to disturb the market prices.’ J. Neusner offers the following interpretation: a fast that is decreed in connection with a drought is not to be decreed for a Thursday, which is a market day, since people would otherwise assume that the harvest would fail and prices would rise on the market.²⁰¹ Such a ruling clearly reveals the awareness that forces of supply and demand governed the volatility of prices on the food market.

Rosenfeld and Menirav refer to price regulation in the Graeco-Roman world and to the price control of the *agoranomoi* in the towns and cities of Roman Palestine, and they place the *sha’ar* in this context. However, it seems that by doing so they have confused the evidence of two rather separate spheres.²⁰² On the one hand, there was the world of the villages and the rabbis, on the other of the town councils and market officials. The separateness of the two worlds seems to have been recognised by a law of the emperor Arcadius from AD 396: ‘One who does not belong to the religion of the Jews shall not establish prices for the Jews when merchandise shall be offered for sale.’²⁰³ Probably Arcadius was confirming a privilege that the Jews had obtained in an earlier period. The point is that the retail prices in the urban markets were controlled by market officials. Although there is no evidence that prices in Roman Palestine were permanently and absolutely fixed, it is also clear that magistrates did continuously interfere in market prices. The exact nature of the regulation is unknown, but supervision implies a maximum. On the other hand, members of the Jewish communities may have observed a fixed market price, the scope of which was probably very limited. Combining the evidence on the *sha’ar* and the supervision by the *agoranomoi* merely offers a false construction.

Conclusions

The limitations of municipal control of the market are reflected in the price policy of local authorities. External grain was not within their reach.

200 Safrai (1994) 318.

201 Neusner (1990) 75.

202 Safrai (1994) 317 emphasised the need to distinguish between the administrative systems of the villages and that of the poleis.

203 *Cod. Theod.* 16.8.10. Quoted from Safrai (1994) 59.

Imperial assistance was limited to a few privileged cities. Despite the efforts made to attract grain from abroad, the sustenance of most towns and cities depended on local resources. The imposition of prices on the market only served to reduce external supplies. Nevertheless, the evidence shows that fixed or maximum prices were occasionally imposed on the grain market. As the measures that were taken in Pisidian Antioch and Oxyrhynchus show, the imposition of prices in times of dearth was aimed at local grain reserves. It should be seen as a counterpart to measures that were to make local grain available to urban consumers. Prices on the consumer market were strictly supervised by market officials, who determined the price of bread in accordance with current grain prices. We have seen several cases that indicate that the market officials controlled the weight of bread. The similarity to the assize of bread that was common throughout early modern Europe is caused by the similarity of underlying factors.

BENEFITS FOR A PRIVILEGED FEW?

It is interesting to see that Pliny's treatment of the food supply in the *Panegyricus* (29–32) is part of a wider section on Trajan's benefactions for his subjects. Pliny begins with Trajan's gifts and the *alimenta* (26–8), arguing that the grants to almost 5,000 children raised the number of children born and thus increased the number of citizens and recruits for the legions. After having dealt with matters of food supply, Pliny continues with Trajan's games and other forms of entertainment, amongst which he included the punishment of the denunciators who had made Rome unsafe during Domitian's rule (33–5).

Pliny's treatment of the food supply in the same context as the *alimenta* and the games serves as a reminder that governmental intervention in the grain market in the Roman world cannot be simply interpreted as a policy to fight poverty or to improve social welfare. The same holds true of private or municipal initiatives. Garnsey and Saller stated that 'euergetism, the public display of generosity by individuals, remained the key factor in the response of local governments to shortage. . . . Its ideology was civic, not humanitarian – very few euergetists would have described what they were doing as poor relief.'²⁰⁴ Such a view is common among modern scholars, who argue that the supply of cheap or free food to part

²⁰⁴ Garnsey and Saller (1987) 101.

of the urban populace was no less a means for the urban elite to display their beneficence than the organisation of gladiatorial games, the financing of public buildings or, for that matter, the alimentary schemes.²⁰⁵

Imperial largess or private euergetism was aimed at those people who were most deserving of beneficence, not those most in need of it. Sometimes, this comprised all (usually male) citizens. A case in point are the alimentary schemes, which offered a subsistence allowance to a specific number of children – boys and girls – until they were fourteen or fifteen years old. The literary and epigraphic sources attest a large number of such schemes, financed by emperors and private citizens, throughout Italy and the rest of the empire. When Pliny says that the emperor's virtue and generosity offer the sole incentive for the poor to raise children, he explicitly relates Trajan's alimentary scheme to poverty in Italy.²⁰⁶ However, the interpretation of the alimentary schemes is disputed. There is little reason to assume that the poor benefited especially from the alimentary schemes. G. Woolf points out that the criteria of eligibility for private alimentary schemes were based on age, gender, legitimacy, free birth and local citizenship, but that no mention is ever made of the material well-being of the families involved.²⁰⁷ Possibly, the recipients were selected more or less at random, though it is suggested that the selection in fact benefited the wealthier families and excluded the poor. The alimentary schemes, Woolf concludes, were examples of imperial or private largess, which was aimed primarily at a privileged few, not at the masses.²⁰⁸ In contrast, W. Jongman argues that *alimenta* were given to almost all boys in a community and that most communities had an *alimenta* scheme. He observes: 'both *frumentationes* and *alimenta* were benefits of citizenship. They were not specifically targeted at the poor, and were not, therefore, poor relief in the strict sense. That is not to say, however, that they did not help the poor.'²⁰⁹

The discussions on the scope and intention of measures concerning the food supply run along similar lines. It has been pointed out that many cases of market intervention occur on special occasions, such as festivals or periodic markets, or that the public or private acts involve goods that were not basic foodstuffs for the masses, but more of a luxury, such as fish,

205 Thus Garnsey and Whittaker (1998) 330.

206 Pliny, *Pan.* 26. It is questionable whether Pliny the Younger uses the term 'poor' in the modern sense of the destitute.

207 Woolf (1990) 209.

208 *Ibid.* 227.

209 Jongman (2002) 62ff. Quote from p. 64. See also Duncan-Jones (1982) 315ff.

meat or the better kinds of bread. On such occasions, it is argued, members of the urban elites, whether as private persons or as municipal magistrates, earned the citizens' gratitude by offering them some extras, which were beyond the usual requirements and needs of the common people. Distributions of food, it is argued, should be seen in the same light as the public banquets that are offered to limited groups within the urban populace. On these occasions, the leading and wealthiest citizens were usually given the best kinds of food. Other groups that received special treatment were, for instance, teachers, youth groups or specific *collegia*. It is clear that such acts of beneficence were no form of poor relief, since those most in need received little, if anything at all. Private distributions of foodstuffs, gifts of money and public meals rather enforced and emphasised inequality among the urban population. O. van Nijf concludes: 'Public banquets and distributions in Roman cities articulated in a variety of mutually reinforcing ways the idea that the social order was based on hierarchy and inequality.'²¹⁰ Even the corn dole in Rome was aimed at a limited group of recipients that was defined in terms of political or social privilege rather than economic need. It is argued that, while the urban elites were very willing to employ their wealth in public display in order to enhance their social status and to legitimise their leading position, they had little interest in the poorest amongst the urban dwellers and rather focused their beneficence on a more privileged public.

In sum, it is claimed that private and municipal activities concerning urban food were generally aimed at offering luxuries to a privileged group. It is not denied that sometimes market intervention dealt with the supply of basic foodstuffs, but such measures, it is said, were limited to times of crisis. Peter Garnsey states: 'Euergetism was typically a response to a specific crisis; it did not seek a lasting solution to the underlying problem.'²¹¹ Whenever food shortages occurred, magistrates and wealthy citizens would take measures that were designed to show their fulfilment of obligations rather than to be effective. In addition, it was not in the interest of the urban elites to lower the prices, since they benefited from them as large landowners. The people who had to take the required steps to alleviate the crisis were also the ones who profited from high prices in times of dearth.²¹² In short, in the sceptical view that is prevalent in modern scholarship, the elite's involvement in the food supply of the common people is incidental and inadequate, directed by self-interest and

210 Van Nijf (1997) 155.

211 Garnsey (1988) 83.

212 *Ibid.* 82f; (1999) 33; Garnsey and Morris (1989) 104; Van Nijf (1998) 322f.

social inequality, and thus primarily effective in offering benefits for a privileged few. Hence, according to most scholars, the urban food supply was essentially left to the forces of the market.²¹³

We should be careful, however, not to reject the good with the bad. Although many of the above points are true, the conclusion may be somewhat limited and one-sided. The above views may be counterbalanced by a few considerations.

(i) While it is undeniable that many instances of governmental measures and acts of private beneficence that are mentioned in the epigraphic and literary sources merely offered benefits for a privileged few, some considerations point in a different direction. It should be stressed that most instances of market regulation or intervention deal specifically and explicitly with the provisioning of grain, the staple food of the Roman world. A lamp from Aquileia, which is decorated with a pitcher of wine, a loaf of bread and a radish and bears the legend *pauperis cena: pane vinu radic*, is witness to the fact that poor people ate bread.²¹⁴ Even stronger: Plautus says of a poor man that he was clothed in rags and lived off bread.²¹⁵ Likewise, in Roman Palestine, the poor often ate nothing but cheap bread.²¹⁶ In Roman Palestine, bread seems to have been more important than gruel or porridge. In fact, both cereal products were often eaten in combination, i.e. gruel was scooped out of the pot with a piece of bread.²¹⁷ The question remains whether they ate wheat or inferior cereals. It is often argued that the urban masses in Roman times ate bread or porridge of inferior cereals instead of wheat.²¹⁸ Both Pliny the Elder and Seneca inform us that the poor ate inferior kinds of bread, while the rich consumed bread of the finest quality.²¹⁹ However, when in the third century AD the distribution of bread was introduced, this consisted of

213 Equally sceptical about the intention to improve the urban food supply on Hellenistic Samos is Gargola (1992) 12–28. In contrast, in an article on price regulation in Classical Greece, Migeotte (1997) 33 states that the interest of the Greek cities in the grain market need not be demonstrated, since it is evident.

214 Corbier (1999) 128.

215 Plautus, *Asin.* 142.

216 Ben-David (1974) 306. Cf. Hamel (1990) 30ff, 39ff: 'Barley bread, *cibarium*, was the mark of the common man, the slave and the poor' (p. 34).

217 Hamel (1990) 12. Similarly, early medieval Europe. Montanari (1999) 174.

218 Thus, Wacke (1992) 644; Migeotte (1997) 35. Likewise, Aldrete and Mattingly (1999) 178, who assume that 'a large percentage of the free poor' in the city of Rome did not even have the income to buy grain at subsidised prices. See also Prell (1997) 82f.

219 Seneca, *Ep.* 123. 1–2; Pliny, *Hist. nat.* 19.53. See also Seneca, *Ep.* 119.3; Martial 11.56.8; Suetonius, *Gramm.* 11.3; Plutarch, *Mor.* 523 E–F. In Classical Greece, the urban populace ate more barley in the form of *maza* (barley cakes) than wheat. Amouretti (1999) 81f, 84f. Cf. Rathbone (1983) 47f.

white bread (*panis sigilinus*).²²⁰ Even the slaves on Cato's estates ate wheat. The larger rations of wheat of workers on Cato's farm in comparison to the *vilicus* even indicate that their diet largely consisted of wheat.²²¹ Hence, the urban populace of the large cities in the Roman world may be considered privileged – the population of Rome certainly was – in the sense that they ate wheaten bread rather than lesser kinds of grain, most of which the majority of the population in the countryside consumed in the form of porridge. Moreover, the rural population consumed a larger variety of foodstuffs, which means that they ate proportionately less cereals than the urban populace.²²²

Most instances of market intervention by the authorities dealt with grain and bread. The regulation of the market of grain or bread was much more far-reaching than comparable regulations of the sale of other foodstuffs. Interventions by central authorities in the municipal food supply were mostly caused by dearth and/or high prices of grain. Moreover, the *Digest* emphasises the interest of Roman rulers in local policies concerning grain funds and grain prices. Similarly, the *sitophylakes*, *sitones* and other magistrates in fourth-century BC Athens supervised and governed the market of grain, flour and bread, but the evidence on the market of other foodstuffs points to less drastic intervention.²²³ In Hellenistic Greece, grain funds usually bought and sold barley, which was a very plain food, and not wheat, the consumption of which was less common.²²⁴ Regulation of the market of wine, olive oil, meat or fish offers no parallel on a comparable scale, although benefactors regularly made such more or less luxurious items of food available at a low price or even free. In short, market intervention and regulation concentrated on the staple food of the urban populace: grain and bread.

220 H. A., *Aurel.* 35. Währen (2001) 187.

221 Cato, *de agri cult.* 56ff. Likewise Duncan-Jones (1990) 143f. Foxhall and Forbes (1982) 74 estimate that grain contributed about 70–75 per cent of the calories in the Greek and Roman diet. The percentage would not normally be higher 'except in the cases of very low status (or unusual) groups'. On the diet of the poor in the city of Rome, Garnsey (1991) 82ff, on malnutrition (1999) 43ff. Cf. Foxhall and Forbes (1982) 63f; Prell (1997) 97f.

222 On different qualities of wheaten bread in medieval times, Desportes (1999) 281. Urban workers in early modern Italy usually ate coarse bread, while rural people ate lesser cereals in the form of porridge. Pelizzon (2000) 129ff. The populace of early modern Rome ate mostly wheat in the form of bread. Revel (1979) 39. In medieval Italy, many peasants and landowners also used to eat wheaten bread. Cortonesi (1999) 269. The early Middle Ages marked a contrast with antiquity, in the sense that the dominance of wheat was replaced by a larger role for lesser cereals. Montanari (1999) 172f.

223 Engels (2000) 112.

224 Migeotte (1998) 238f.

(2) Neither the elite nor the masses can be treated as homogeneous entities. To begin with, there was a wide gulf dividing town and countryside. Although in general the elite's wealth was based on agriculture, the ruling elite was a truly urban elite, who performed their social and political roles first and foremost on the urban stage. The wealthier and more powerful these families became, the more the common people of the countryside were lost from view. In that sense, the peasants, tenants and rural wage-earners, who constituted the vast majority of the population of the Roman world, were the truly underprivileged masses of the Roman world. Not surprisingly, only the towns and cities seem to have profited from market intervention and regulation, often to the detriment of the countryside. Moreover, the majority of the urban populace should not be mistaken for a starving mob of beggars, although most of them were definitely poor.²²⁵ The ancient elite perceived everybody as 'poor' who did not belong to their own class.²²⁶ Even the propertied classes among the urban populace became anxious when the urban food supply failed. During a riot in 40 BC, even well-to-do people protested, as is shown by Appian's remark that, after Mark Antony's troops had attacked and dispersed the protesters, the soldiers stripped some of them of their fine clothes.²²⁷ Regarding early modern cities, it has been said that 'working people, not the destitute, were the target of urban provisioning policies',²²⁸ and the same is true of antiquity. Measures by authorities and private individuals were aimed at the common citizens of the towns and cities. The bulk of the urban populace was not in need of charity, but their existence was sufficiently precarious for them to welcome – or even demand – measures that would guarantee an abundant and cheap supply of basic foodstuffs. If indeed there was a privileged minority that was deemed deserving of the elite's beneficence, this minority may very well have comprised the majority of common citizens of the towns and cities.

225 On urban poverty, see Dio Chrys., *Or.* 7.105f. Whittaker (1993) 4 points to a passage in John Chrysostom in which he states that in his time (4th century AD) 10% of the population of Antioch were poor and in need of support. Whittaker also offers the following estimates concerning early modern cities: 4–8% of the urban populace were incapable of feeding themselves, 20% permanently threatened, 30–40% more secure in their subsistence. See also Garnsey (1991) 67f.

226 Whittaker (1993) 8.

227 Appian, *Bell. Civ.* 5.68. Pointed out by Whittaker (1993) 7. Cf. Brunt (1966) 23ff concerning the involvement of artisans and shopkeepers in late Republican riots. It is important to note that such groups were organised in *collegia*, which was an advantage when using violence to substantiate their claims.

228 Pelizzon (2000) 145.

Moreover, most measures benefited not just a privileged section of the community, but all urban buyers equally, whether they were wealthy or poor, citizen or non-citizen, servile or free. Regarding Classical Athens, V. Rosivach observes: 'the price of a measure of alphita [barley] or a loaf of bread was the same for everyone, be they citizens, metics or slaves.'²²⁹ This is true of Roman times as well. While gifts or public banquets specify and distinguish between various groups of recipients, market intervention is often aimed at the citizenry at large. Public or private provisioning of the market was often explicitly intended for the benefit of 'the plebs' or 'the community'. A private benefactress from Termessos (Pisidia) promised 'an ample supply for the plebs'. The inscription of the artisans of the town that was set up in her honour even expressly states that she supplied grain 'to the entire plebs' during the grain shortage.²³⁰ S. Mrozek has pointed out that in Italy the most common terms to indicate the recipients of grain schemes are *populus* and *municipes*, while sometimes *cives* is used. *Municipes* usually indicates the citizens, while *populus* may also include the non-citizens, e.g. slaves and visitors.²³¹ In the western provinces too, the beneficiaries of private or public initiatives usually consisted of the populace at large.²³² Mrozek draws attention to an inscription from Forum Sempronii, which was dedicated to Lucius Maesius Rufus, who had sold grain below market price. The inscription was dedicated by the *municipes et incolae*, which means that not just the citizenry had profited from the measure.²³³ In sum, even though the authorities generally intended their market intervention primarily for the benefit of the citizens, this group was taken very widely and did not comprise merely a small, privileged section of the urban populace.

(3) The urban populace was not merely a passive public for the stage on which the ruling elite performed their social role. Even if dearth did not threaten their physical survival, high prices sufficiently disrupted their accustomed way of life for the urban populace to demand that measures be taken to maintain their existence. High prices affected not only the life of the beggars and vagabonds on the margins of society, but also that of the labourers, artisans and other working people who made up the majority of the towns and cities. The interplay of intervention,

229 Rosivach (2000) 56.

230 TAM 3.I.4; 3.I.62. Quoted from Van Nijf (1997) 113.

231 Mrozek (1994) 98f.

232 Dardaine and Pavis D'Escurac (1986) 297.

233 CIL 11.6117. Mrozek (1994) 99. Engels (2000) 124 rejects the notion of 'eines sozialstaatlichen Denkens' in the Greek polis. Likewise Garnsey and Morris (1989) 105. See also Grassl (1982) 65ff, 84ff.

expectations and food riots determined the attitude of rulers and subjects towards urban food supply. In other words, when authorities and prominent citizens intervened in the market in order to ensure an abundant and cheap supply of grain, they raised expectations that could result in rioting when these expectations were not met. In turn, the fear of riots could induce the political and social elites to protect the urban populace from the vagaries of the market. Publicly acclaimed regulations on 'fair prices' 'for the common good' left no doubt about the authorities' opinion of the proper workings of the market. Many examples show that the urban food supply was publicly addressed as a moral issue that concerned the whole community. The effect of these public statements was dual: they strengthened the authority of the rulers by advertising their exertions on behalf of the community and legitimised the notions of the populace regarding a properly functioning market.²³⁴

L. de Ligt sees the imperial *mandata* concerning the provincial governors' role in regulating the grain market as a largely symbolic concession to their subjects, a means to legitimise their rule without the aim of being effective.²³⁵ Regulation of the market by the authorities, however, must have been more than that. Even if authorities were reluctant to intervene, measures that were merely taken for show would inevitably have turned against them.²³⁶ For the urban populace, it did not matter whether the authorities' paternalistic messages to the public were serious (as I tend to believe) or not. As soon as the authorities had shown by their words and deeds that they accepted responsibility for the urban food supply, maintaining social and political harmony in the cities required further actions.²³⁷ Fourth-century Antioch offers ample illustration of this.

Intervention and expectations interacted reciprocally, which may also explain why both the occurrence of riots and the nature of market intervention may have differed between various regions of the Empire.

²³⁴ In more detail in Erdkamp (2002b).

²³⁵ De Ligt (2002) 12ff. He refers to Thompson's investigation of English laws concerning the market, but one wonders whether comparison with less advanced markets would offer the same conclusion.

²³⁶ Thompson's concept of moral economy shows that the people's ideas of what was just were partly determined by the rulings of the authorities. Randall and Charlesworth (2000) 20: 'The key empowering and legitimising factor behind the moral economy of the crowd was the fact that they knew that the law provided the consumer with certain protections against rapacious farmers, dealers and factors.'

²³⁷ Fellmeth (1998) 314f argued that the urban populace failed to understand the economic aspects of shortages and therefore aimed their protests at the authorities. Fellmeth fails to understand that the rioters addressed those people they thought responsible for the proper functioning of the market.

In the Western provinces, authorities and prominent citizens seem to have responded less structurally to the weaknesses of the grain market that threatened the subsistence of the urban populace. Inscriptions concerning the urban grain supply are relatively scarce in most of the Western provinces. Among the 28 inscriptions found in the western half of the Empire (apart from Italy), Africa and Spain are well represented (12 and 8 inscriptions respectively), but a mere 8 inscriptions are all that the rest of the Western provinces has to offer.²³⁸ Differences in the social fabric and hierarchy of the urban communities in the West in comparison to the towns and cities of the Greek East may be part of the reason why the degree of market intervention and the threat of rioting seems to have been more intense in the latter.²³⁹ Some historians have noted the differences between East and West, but have sought the explanation in soil and climate, which in the West are supposed to have been better suited to the cultivation of grain.²⁴⁰ A brief look at the occurrence of severe famine in Western Europe until the eighteenth century shows that there is little truth in this explanation.²⁴¹

(4) Despite their common reliance on landownership and agriculture, the elite cannot be regarded as a homogeneous group whose actions and considerations were determined by the same interests and ideals.²⁴² The fact that an angry mob could threaten to burn a leading magistrate alive if grain prices rose too high indicates that even among the elite different viewpoints could mean conflicting interests. While some estate-owners gained from high prices and large profits, other leading families feared the disruption of the social fabric of the urban community. The considerations that each individual member of the elite made depended on his economic, social and political position. Whether the ambitions of individual members of the Roman elites went beyond the mere pursuit of profit and included maintaining or achieving social prominence depended on the size and social diversity of the community, the status the family

238 Dardaine and Pavis D'Escurac (1986) 291f. Cf. Dirscherl (2000) 12.

239 On Egypt, Sharp (1998) 310ff: regular magistrates rather than irregular liturgists. He also points out that Egypt – in contrast to other parts of the Empire – rarely suffered serious food crises.

240 Rostovtzeff (1957) I 146f; Dardaine and Pavis D'Escurac (1986) 293; Dirscherl (2000) 14f.

241 Throughout Europe, famines that had a serious short-term impact on demography occurred several times each century from the later Middle Ages (when adequate sources emerge) until the 18th century. The literature on this topic is vast, but the following I found particularly useful: Abel (1974); Watkins and Menken (1985); Walter and Schofield (1989).

242 On the heterogeneity of the upper classes (below the *ordo senatorius*), Alföldy (1984) 106ff, who notes: 'in der Regel war nicht einmal der *ordo decurionum* ein und derselben Stadt homogen' (p. 111).

possessed and the expectations that were raised in previous years. Not only was the urban community the stage on which social ambitions were realised, the disturbance of the social fabric threatened the political position of the leading families. The most prominent citizens of the towns and cities were the closest to the fire when things went wrong. Hence, some families ingratiated themselves with the urban populace by individual acts of beneficence, and worked in their own interest by supporting public measures concerning the community's food supply.²⁴³

Dio Chrysostom sheds additional light on the motivation for the ruling elite of Roman provincial towns to maintain harmony and stability: beware, he lectures his audience, that your conduct does not attract the attention of the Roman authorities. This is not a threat towards the rioting crowd, since there is no evidence that Roman troops ever intervened in local disorders. The ruling elite in the provincial towns and cities did not have any troops at their disposal to deal with mass riots. Their Roman overlords expected them to rule their communities by influence and authority. Hence, as J. Engels points out, in years of war and hunger, the *sitionia* was an important instrument to the governmental class in the *poleis* to avoid food riots and unrest. Violence would not only have threatened the entire social hierarchy, but also, within the framework of Roman provincial government, have provoked direct intervention by the Roman rulers.²⁴⁴

We may conclude that the ideology of social distinction does not necessarily rule out a desire by central authorities and municipal elites to intervene in the food market. On the contrary, the social hierarchy provided the foundation that ultimately determined the ways in which the market was regulated and the extent to which market intervention was sought. There were two sides to this. On the one hand, the social hierarchy and social harmony in the towns and cities could be severely threatened by disturbances of the food supply. It was thus a matter of self-interest and preservation of the social order when local rulers tried to

243 Kloft (1988) 152 points to a comment made by Aristotle (*Pol.* 1321a33–40): members of the elite pay for their high-ranking posts by financing festivities, monuments and public banquets. Quass (1993) 349 points out that the increasing expenses that were expected from officials resulted in a gulf between a small group of prominent families that had the wealth to hold public posts and the rest of the citizenry.

244 Engels (2000) 123: 'In Kriegs- und Mangeljahren war die Sitionia ein wichtiges Mittel der Honoratiorenregimenten in den Poleis, um Hungerrevolten und Stasis zu vermeiden. Denn gewalttätige Unruhen hätten nicht nur die gesamte Sozialordnung bedroht, sondern unter den Rahmenbedingungen der römischen Provinzialordnung direkte Interventionen der Römer provoziert.'

ensure an adequate market supply and stable prices. On the other hand, it can not be ruled out that the actions of local rulers and individual members of the elite were also governed by a sense of duty.²⁴⁵ It seems a rather limited view to consider beneficence solely as a conscious effort by the superior classes to impose an awareness of social distinction onto those who were socially inferior. Although the sceptic may never be converted, a sense of obligation may have been an essential part of the awareness of social distinction.

²⁴⁵ Quass (1993) 347ff emphasises that euergetism was not simply a matter of coercion or self-interest.

Conclusions

The grain supply is an important element of the economy of the Roman world and of its social and political history. Grain was the most important item of food in antiquity. Hence, it is more central to our understanding of the Roman economy and society than, for instance, olive oil or wine. The economy is partly a response to climate and geography; economic development can be seen as a struggle to overcome the ecological factor. This may explain many of the similarities between Mediterranean societies in Roman and later times. However, neither the economy nor society are determined solely by ecological constraints. Social and political factors played an important role. Hence, an analysis of the grain market is as much a social and political study as it is an economic one.

All sectors of the economy depended ultimately on their access to the means of subsistence, whether the people engaged in these sectors produced food, other items and services, or – in an economic sense – nothing at all. The size of these sectors and their relations to one another determine the structure and scale of the economy. The distribution of food may be seen as the mechanism that connects them all. The division of labour in pre-industrial societies is characterised by a large agriculturally productive sector and a rather small non-agricultural sector. It is commonly stated that, owing to the low productivity of agriculture in the Roman world, about 80 per cent of the population were engaged in agriculture, leaving only 20 per cent for all other sectors. These figures derive from other pre-industrial societies, and in a general sense they are probably about right. Nevertheless, it is an incorrect representation of the division of labour in the Roman world. On the one hand, an analysis of the underlying factors shows that it is not the technical level that determined the surplus production of Roman agriculture. On the other hand, the size of the non-agricultural sectors is underrated if expressed as that part of society that is not working the land.

It used to be thought that, because of environmental conditions and agricultural techniques, yields in Roman times were low, which acted as an almost natural barrier to growth. However, neither the assumption that yields were particularly low nor that the level of surplus production was directly caused by yields is true. The early modern parallel offers no reason to distrust the claims by Cicero and Varro that Roman estate-owners were able to increase their seed eight- or tenfold. Mediterranean lands may indeed not have been manured optimally and precipitation may have been unfavourably spread, but uncertain rainfall and lack of summer grazing plagued early modern farmers just as much as ancient cultivators. Yields in Egypt were substantially higher, but those in Palestine or Greece possibly lower. The grain-producing parts of Roman estates in Italy may even have produced a surplus of 70 or 80 per cent. The yields and surpluses that were achieved by peasants and humbler farmers were significantly smaller, but we may confidently state that agriculture in the Roman world was technically capable of producing a surplus sufficient to sustain a much larger part of the population than a mere 10 or 20 per cent.

If on aggregate the surplus production remained relatively low, the explanation has to be sought not in the technique of agriculture, but in its economic structure. The two main elements responsible for the restriction of surplus production can be summarised under the headings 'labour' and 'market'.

LABOUR

Labour is one of the means of production, and though it is not more important than capital or land in determining agricultural productivity, it is the most interesting from the point of view of economic structure. The balance between the input of capital, land and labour may vary, which is based on the fact that one production factor can substitute another. However, one production factor cannot be substituted by another indefinitely without reducing efficiency. The basic economic difference between farming practices on peasant farms, market-orientated ('family') farms¹ and large estates consists of the variation in the input of production factors. The capital, land and labour markets determined the degree of flexibility that producers had in gaining access to means of production. In

¹ See chapter one n. 7 on the meaning of the term 'family farm'.

the Roman world, limited access to credit, an inflexible labour market and a constrained availability of land together constituted imperfect factor markets. Tenancy compensated for this weakness, because it offered access to means of production: capital (in the form of long-term investment) and land on the one hand, labour, management and capital (in the form of short-term investment) on the other. Tenancy, in particular sharecropping, was also a means for both parties to reduce risk.

The generally low input of land or capital had an important impact on the input of labour on the farms of smallholders. Peasants worked on small plots without much money for investment, labour being the only means of production they could maximise. Consequently, peasants worked small plots with too many hands, resulting in low labour productivity. In contrast, estate-owners adjusted the input of labour to the level of input of capital and land, which resulted in more favourable levels of labour productivity. Peasants sometimes used their plot to grow a cash crop, since most cash crops required more labour and produced more monetary value on the same plot of land than grain. Sheep herding may also be seen as a way to employ labour profitably without needing much capital or arable land. Alternatively, smallholders used part of their household's labour to produce goods or provide services, the exchange value of which was used to buy the goods they needed, primarily food, on the market. The use of labour away from the land was constrained by the risks inherent in the market, which induced most rural households to be as self-sufficient as possible.

Nevertheless, smallholders employed part of their household's labour outside their arable farms. Peasants could not fruitfully employ all the available labour on their own land. The law of diminishing marginal returns ruled that each additional day's work employed on the land contributed less and less to total production. The Russian economist Chayanov stressed the 'drudgery-avoiding' tendency of smallholders, which means that, as soon as their subsistence requirements were fulfilled, peasants tended not to work at all. Whether peasants employed the surplus labour that was available in their households depended on the household's production goals. In the first place, they tried to achieve a level of production that offered long-term food security. Beyond physical survival, households aimed at retaining their social existence, which means that households, even relatively poor ones, wanted to preserve the status they had. Hence, structural underemployment on the farm and production goals that went beyond physical requirements offered a stimulus to subsistence farmers to employ part of their labour outside the

farm. The employment of this labour was also shaped by the seasonal underemployment that is inherent in arable farming, and by the gender division of labour.

The rural economy offered few full-time employment opportunities. Agriculture absorbed much of the available labour capacity. It was a 'residual employer' in the sense that much of the available labour that could not be sustained by non-agricultural employment found a living in agriculture. The result was that labour productivity in small-scale farming, and thus income, was very low. It also means that a rural proletariat, which by definition could not fall back upon direct subsistence farming, cannot have been numerous in most rural regions. Demographically speaking, much of the rural population was either contained within smallholding households or pushed outside the rural economy. Large cities in the Roman world – foremost Rome itself – were characterised by massive immigration from the countryside. Owing to the extremely high levels of mortality, the populations of large Roman cities were unable to reproduce themselves and thus needed the constant influx of new inhabitants to retain their size.² In short, that part of the rural population that could not be sustained by the more than saturated small-scale farms was absorbed by the large cities' insatiable demand for immigrants.

The relationship between subsistence production and employment strategies is important for our understanding of the non-food-producing sectors of the economy. Some of the households produced more food than they required (i.e. a surplus), others produced less. In order to achieve sufficient income to reach subsistence level, the latter households employed part of the available labour outside the farm (often, but not necessarily, in the non-food-producing sector). The necessary agricultural surplus was produced elsewhere. In reality there was a grey area in which households fluctuated between both situations, in the one year producing a surplus, in the other not. Most peasant households, however, tended to produce a surplus in most years, if only because long-term security demanded that they set their production goal at a safe margin above subsistence needs. If families lacked the means to do so, they belonged to the rural proletariat rather than the peasantry. As soon as peasants produced enough to sustain their household, any additional labour was surplus to the subsistence production. As we have seen, whether they employed this labour or not depended on the household goals. Alternative

2 Recently, Jongman (2003) 106ff.

employment strategies only had to offer a low income in order to exceed the income that was possible on the farm. In other words, surplus labour in peasant households, if employed outside the farm, was cheap, since the reproductive cost of the non-food-producing labour was shifted to the food-producing sector.

The above invites several observations concerning the structure of the economy: first, the division of labour, traditionally estimated as 80 per cent in agriculture and 20 per cent in non-agricultural sectors, may be false in the sense that the '80 per cent' of people engaged in farming offered a significant element of non-agricultural labour (in for instance transport and manufacture).

Secondly, regions might export manufactured goods without needing a complementary flow of food imports. This is important regarding inland regions, which were unable to import food. In so far as manufacture was directly sustained by agriculture, rural households in inland regions could earn a cash income by producing high-value, low-bulk goods (for instance textiles) for external markets.

Thirdly, in many regions the economy was insufficiently developed to sustain a large non-agricultural population without the element of externalisation of reproductive cost. Only in those places where the demand for labour from the non-agricultural sector was sufficiently high and stable could a large element of labour exist independently from agriculture. In such regions, rural households may have consumed a significant part of the food surpluses produced in commercial farming.³

Fourthly, rural demand for services and non-agricultural goods was largely fulfilled by rural labour, because this was cheaper. Two elements played a role: (1) Rural labour was partly cheaper because of the externalisation of reproductive costs. This applies not only to human labour, but also to the labour of the farm animals that were used in transportation. (2) To the extent that the raw material was rurally produced (for instance, flax and wool), it was less costly to locate the final stages of the production process in the countryside. Keith Hopkins' point that the demand for goods and services by the rural masses was extensive on aggregate is true, but it was largely limited to a rural-rural exchange, rather than a rural-urban exchange. Much of the infrastructure for this exchange may have been provided by weekly markets in market towns and by periodic markets in the countryside. This may also mean that many

3 See also Erdkamp (1999).

rural households earned a monetary income by supplementary employment and did not need to produce a surplus in order to earn the money they needed to pay monetary taxes or rent. The rural fulfilment of demand severely restricted the market for urban products in the countryside. The absence of much exchange from the cities to the countryside confirms the idea that many ancient cities were consumer cities. Though there undeniably was a substantial productive element in urban economies, they did not produce massive flows of goods intended for the rural masses.⁴

MARKET

Peasants in the Roman world may have been subsistence farmers in the sense that they aimed their production strategy at fulfilling their subsistence need, but they were not primitive, autarkic cultivators who lived and worked isolated from a non-peasant economy. Peasants are to be understood as integrated in and determined by a wider market economy. Smallholding households shifted their subsistence strategy to more productive means if they regarded these means as sufficiently secure. However, volatility of grain prices on the one hand and an insecure and low level of demand for goods and services on the other meant that alternative strategies were limited and risky. The limitations of both the markets of land, capital and labour (factor markets) and those of crops, services and manufactured goods (product markets) restricted their production strategy. In economies that were characterised by weak markets, nothing offered as much long-term food security as direct production. The weakness of both factor and product markets caused a high level of labour input in small-scale farming, leading to a low level of labour productivity, and all the consequences we have just seen.

Hence, the extent to which the grain market in the Roman world was able to cancel the effects of harvest shocks – in other words, the degree of market integration – is of crucial importance for our understanding of the ‘wider economy’. If the grain market was effective in cancelling out harvest shocks, prices were stable and risks low, which stimulated investment in agriculture and opened up opportunities for non-food-producing sectors in the economy to grow. If the grain market was not effective, the economy could not free itself from the restraints of primary food production.

4 See also Erdkamp (2001).

Two elements were involved: market integration in time (carry-over) and in space. In his study of the regulation of grain markets in Europe between 1500 and 1900, Karl Gunnar Persson wrote: 'When harvest shocks are independent and local, inter-regional trade and carry-over can be expected to stabilise prices, though not to the extent that makes price fluctuations disappear. *It is easy to show* [my italics] that if storage and transport costs are high within a large geographical region, large swings in prices will necessarily occur even though output shocks cancel out. This will also happen over time in a single region.'⁵ Although it is not so easy to show such things with regards to the Roman world, because ancient historians lack the sources that Persson and his colleagues have, we may take Persson's succinct model as starting point. I will adhere closely to Persson's six factors, though not in his order.

(1) The geographical unit under discussion consists of the entire Mediterranean region, which is characterised on the one hand by being composed of many geographically and climatologically diverse micro-regions, on the other hand by the Mediterranean Sea itself. In size, it is not unlike Northern Europe (stretching from France to Russia and from the Alps to the Baltic), but the Mediterranean Sea ('*our sea*' in Roman perspective) made it dissimilar to the vast stretches of land of the more northern countries.

(2) The size of harvests fluctuated heavily between years. Because of the marginal conditions of agriculture in many regions of the Mediterranean world, harvest shocks may well have been larger than in central Europe. Since climatic and geographical conditions varied tremendously within the Mediterranean microregions (and one may add the human factor of crop destruction in times of war), harvest shocks were largely independent and local. Harvest shocks were partly cancelled out in the sense that the interannual fluctuation of the total harvest was much more limited, though it is unlikely that on aggregate interannual fluctuation was nil. Surplus production fluctuated even more than harvest size, because the input factors were inelastic; the smaller the scale of agricultural production, the more variable surplus production was.

(3) Storage costs (including losses due to deterioration over time) are difficult to establish. Comparison with other times may indicate that storage costs were high, but not excessively high. Equally important was the opportunity for gain: what profits were to be gained by storage over

⁵ Persson (1999) 65. Cf. Persson (1996) 698.

time? These were determined by future price developments, which, in turn, depended on price variation over time.

(4) Regarding price development over time, one must distinguish between price development within a year and between years. A very strong cycle determined the price of grain within the year, in coherence with the growth cycle: in normal years, prices were lowest at harvest time, and increased to about double that level just before the new crop was harvested. Paradoxically, the main incentive to store depended primarily on the failure of carry-over to stabilise prices. From a marketing viewpoint, the primary goal in accumulating stocks was not to carry them over into next year's harvest cycle, which would have reduced price volatility over time, but to profit from the very predictable, and thus reliable, annual price cycle that resulted from the limitations of long-term storage.

The price developments between years, largely determined by harvest size, were independent and unpredictable. Because of their unpredictability, future market prices had little impact on the production strategies of farmers, whose considerations were determined by short-run price movements. One important feature of the inter-annual price development added to the predominantly short-run nature of production strategies: owing to the inelasticity of the demand for grain, the price increased more than proportionately to the decrease of the harvest. Good harvests created oversupplied markets, and thus slump prices. Failed harvests offered good prices, though, which made up for the decline in bulk. In contrast, the elasticity of demand for wine or olive oil and the more highly integrated markets for these crops meant that prices were more stable, which resulted in good prices in good harvest years. Nevertheless, large investments in other crops than grain did not preclude extensive involvement by estate-owners in the grain market. Estate-owners did not grow grain only for their own needs. Investment in cereal cultivation also held little risk, because it required little cash, while there always was a market, even if sometimes at low prices. Well-to-do farmers were able to wait until the prices rose at the end of the growth cycle, and thus in most years could obtain at least reasonable prices. Grain may not have been the most profitable crop, but the larger surpluses on commercial farms and their better position as sellers on the grain market meant that commercial farmers supplied much of the grain sold on urban markets.

The price development of grain in good and bad harvest years was detrimental to marginal producers, who had to sell at low prices when the harvest was good and had to buy at high prices when the harvest failed. Thus the grain market in the Roman world favoured the large landowners

and well-to-do farmers in almost every respect: they could sell grain at high prices, including the grain they had obtained at little cost from their tenants; they had better access to means of transport and storage; and they had access to those in power and to outside information.

(5) Transportation costs were high over land, less so (but still far from negligible) over sea. However, one may add a point that is missing in Persson's succinct model: the role of profit and risk in overseas trade. The distribution of food by means of overseas trade was not only determined by transportation costs, which, because of prevailing winds and varying risks, were not even very homogeneous in the Mediterranean Sea, but also by the conditions of trade. Profit and risk went hand in hand, but traders favoured those regions that offered good information, commercial infrastructure, credit, sufficient buying power, profitable return cargoes, and secure supply. The inequality between Mediterranean regions affected supply as well as demand; there was no automatic mechanism ensuring that local shortages caused imports. Neither were 'accidental surpluses' automatically turned into exports. Thus, despite low transport costs, fragmentation into microregions and the important role of small-scale maritime trade, commercial transport did not cancel all local harvest shocks.

(6) Prices varied between regions, not only inland, but also between regions that were connected by the sea. Again, one may observe that differing price levels constituted the main incentive to overcome the costs and risk of transportation and to distribute grain. The price differences within the Roman world not only reflected differing transportation costs, but were also caused by local differences in the conditions of production, trade and the market. This points to a situation in which local grain markets were not connected within a large, integrated market that spanned the Mediterranean Sea.

Thus, Persson's model helps to explain that price instability remained a fact of life, but in some places more than in others. Connectivity made a difference: the larger the grain market one was part of, the less the impact of harvest shocks.

URBAN GRAIN SUPPLY

The grain supply of Rome and the other towns and cities in the Roman Empire must be seen against the background of a grain market that was not very successful in coping with harvest shocks. Owing to the inelasticity of demand, prices responded vigorously to fluctuations in market

supply. The urban populace was very vulnerable to such price fluctuations: first, their buying power was low; secondly, the income of many wage-earners was unstable; thirdly, urban consumers had little recourse to alternative foodstuffs; fourthly, increased spending on food necessarily implied a reduction in spending power that was available for other goods, which meant loss of income for those who catered for the needs of the common people. Even if outright starvation could be limited to beggars and vagabonds, a prolonged rise in prices could seriously threaten the sustenance and way of life of the urban populace, with all the ensuing consequences for economic and political stability.

The city of Rome was exceptional, but its grain supply is a good case in point. It is commonly but wrongly believed that private merchants largely supplied the city's market, and received privileges for doing so. Instead, Rome was primarily sustained by a system that made use of public channels and in which private enterprise largely co-operated with state officials to convey tax-grain to Rome. The grain was distributed by a two-tier system: part of it by-passed the market by means of the *frumentationes*, part of it was probably sold to traders or bakers. The reason for the almost exclusive reliance on the transportation and distribution of public grain is obvious: Rome controlled the crops of such accessible and fertile provinces as Sicily, Africa and Egypt. In view of the weakness of the grain market, the most reliable way to ensure a stable and adequate supply to the Roman capital was to collect taxes in the corn provinces and ship the grain to Rome. The conveyance of public grain to Rome may not have fed the city completely, but it left only a relatively small role for other channels of distribution.

The other side of the coin was that the role of Sicily and Egypt in long-distance distribution was exhausted by the flow of tax-grain towards the capital and the armies. Arable farming on Sicily also needed to produce sufficient surplus to sustain the internal division of labour. Hence, the tithes on Sicily devoured all exportable surpluses. Trade played little role in the long-distance distribution of Sicilian grain. The role that Sicily played in Rome's state supply left little scope for supplying the Mediterranean grain markets. The same applies to Egypt, which was the largest supplier of grain to Rome in imperial times. There is no evidence for a large role for Egyptian grain on the grain markets of the Mediterranean world in Roman times, or indeed during later periods. Most telling is the fact that, after the flow of tax-grain towards Rome and Constantinople had stopped, there were no shipments of Egyptian grain abroad on a comparable scale.

Rome was an exceptional case, though, and no other city could rely to such an extent on public supply channels. Most cities in the Roman Empire mainly relied on the resources of their hinterland. However, although long-distance supply was exceptional, it was crucial in those years when the hinterland failed and when a few shipments might mean the difference between hardship and starvation. In isolated regions, the limitedness of markets restricted the emergence of commercial infrastructure and networks. Markets that consisted of small towns were not capable of supporting a complex network of grain merchants, contractors and middlemen. The near self-sufficiency of most towns and cities hampered the development of commercial supply mechanisms that were sufficiently strong to deal with food shortages when they occurred.

In the absence of a large and well-developed network of merchants, urban authorities had to act as substitutes when there was pressing need for imports. Municipal grain funds ameliorated the impact of harvest shocks by making grain available on the urban market. Public schemes functioned on the basis of the greater access by the urban elite to capital, information, social networks and coercive power. Contacts with the emperor or with high-ranking officials occasionally led to contributions of tax-grain. The necessity for authorities to intervene directly by buying and importing grain reflects the weakness of the supra-local grain market. The nature of market regulation confirms the general reliance on local sources in most towns. Measures that were taken in times of crisis usually consisted of local stores being forced onto the market for a fixed or maximum price. Price fixing was not exceptional in the Roman Empire, but two factors limited its use. First, it was ineffective when trying to attract outside traders. Secondly, it was not in the interest of the land-owners who supplied the towns and cities and who dominated the town councils to diminish their chances of making a good profit at a time when prices were highest. However, there were good reasons for alleviating the impact of price fluctuations, since high prices could lead to unrest and even violence. Those families that dominated the urban government were the ones that were closest to the fire when things went wrong.

A MODEL FOR GROWTH

This study has concentrated on economic structures and constraints, which has left little scope in our analysis for change and innovation. However, the restrictions of the market also contribute to our understanding of growth in the Roman economy. We could define economic growth

as a rise of the per capita production of goods and services,⁶ but that would not advance us much further, since we cannot measure it with any accuracy in any period previous to the eighteenth or nineteenth century. We cannot even make an educated guess for antiquity. Hence, it may be better to define economic growth by two basic elements: first, as an increase in the division of labour and, secondly, as a rise in the scale of market integration. We cannot measure these either, but we can at least say something sensible about them. However, before we address economic growth in the Roman world, we should realise that economic historians stress the ‘abnormality’ of growth in most of early modern Europe. See, for example, the observation on economic growth by R. Brenner: ‘The lack of a real breakthrough was indeed reflected in the inability of the “modern world economy” to provide the material underpinnings for continuing economic-industrial growth in most of Europe throughout the early modern period.’⁷ (Hence, historians of antiquity should not feel compelled to prove much economic growth in order to refute Finley’s primitivism.)

Three elements may be distinguished in economic growth: geographical expansion, shifts within a fundamentally unchanging structure, and innovation. Much of the economic growth in antiquity consisted of the geographical expansion of the pre-industrial Mediterranean economy in Europe and on the margins of the Mediterranean world in the East as a result of the Roman conquest.⁸ However, of more importance from the viewpoint of this book are the shifts within the economy of the Mediterranean world.

The increase of labour productivity and surplus production in the Roman world was partly related to an increase of commercial agriculture at the cost of subsistence farming. Although smallholders never disappeared, more and more land came into the possession of large landowners, who increased the scale of cultivation and lowered labour input, resulting in a higher and more stable surplus. Secondly, the spread of new techniques that accompanied the increase of capital-intensive commercial farming resulted in higher yields and thus more surplus. Thirdly, surplus production increased as tenancy increased on the expanding holdings of the rich. Three reasons may be identified: (1) Landlords had an interest in efficiently-producing tenants, who therefore invested more capital and less labour than peasants in the same stretch of land.

6 Millett (2001) 19f.

7 Brenner (1977) 72. Quoted from Van Zanden (1996) 62.

8 Central Anatolia may be seen as an example of the latter. Mitchell (1993) I 241ff.

(2) The rent they siphoned off forced cultivators to increase their production goal. (3) Tenants could count on the support of their landlord, in whose interest it was not to see his tenants starve or go bankrupt. Hence, tenants were less vulnerable to the risks involved in specialisation and market-orientation.

Risk was an important factor in the degree of specialisation and commercialisation of the economy. Changes within this field could result in economic growth without initial innovation in techniques or institutions. The majority of the population consisted of smallholders, whose participation in the market largely depended on the balance between their vulnerability to risk and the extent of that risk. A wealthier household could bear an occasional loss more easily than a poor family continuously living on the brink of disaster. The extent of the risk depended on the nature of the market. Market-oriented subsistence strategies consisted of the exchange of cash crops, manufactured goods or services for food. The food security of market-oriented smallholders was threatened when food prices rose and/or when the price of services, goods or cash crops fell. Hence, an important factor in the degree of specialisation and commercialisation was the degree to which the wider economy offered price stability and a secure demand for goods and services. Since food shortages not only resulted in high food prices, but also indirectly disrupted the wider economy, market-oriented households faced a double danger: that of high food prices and of low demand for their crops, goods or services.

Market integration was able to reduce the risks inherent in market-orientation in so far as it was able to alleviate the impact of harvest shocks. When the extent of the risk diminished, poor households were more inclined to opt for a market-oriented subsistence strategy. Hence, an increase in market integration stimulated an increase in specialisation and commercialisation. A higher degree of specialisation and commercialisation among smallholders meant that less labour was invested in cereal farming. Since a lower level of labour input in cereal farming resulted in higher labour productivity, the effect of specialisation was an increase in labour productivity. Moreover, when smallholders could opt for specialisation, they were also more able to adapt their cropping strategy to soil, climate and natural resources. As the market freed the people from the restraints that bound them to food production, the division of labour and per capita production increased.

Against the assumption that trade evened out local harvest shocks, I have stressed the constraints on market integration in the Roman Empire. This is not to deny that markets connected producers and consumers on a

vast scale, but to warn that the degree of connectivity should not be exaggerated, even along the coasts of the Mediterranean. Connectivity and isolation were unevenly spread across the Mediterranean world. We may distinguish a core, consisting of a 'global' network of commercial centres and those regions that were lucky to be situated along busy shipping lanes, and a periphery that contained economic zones that were at best regionally integrated, at worst underdeveloped and isolated. The ecological restraints that held down the economy of isolated regions in the Roman world continued to do so until the dawn of industrialisation.

In the 'core' regions, a higher degree of market integration started an upward cycle of growth, in which the grain market acted as both cause and effect. Italy, for instance, saw the growth of towns, the improvement of infrastructure (roads, harbours, permanent and periodic markets) and experienced an increase in the cultivation of cash crops and of non-food-producing activities. The improvements of trade and travel led to more and faster communications. Information on harvests and grain prices travelled along busier shipping lanes. The *pax Romana* and the geographical expansion of the Empire itself had a beneficial impact. Roman government certainly improved communications, while Roman taxation in kind gave rise to grain flows that may have been more successful in alleviating harvest shocks than the free grain trade. Rome, far from being a parasitic city, stimulated growth by creating a stable market for all kind of goods and services, the effects of which radiated far into the city's hinterland.⁹

However, some of the limitations imposed on the economy could not be overcome. Geography and the difficulty of inland transportation isolated the interior of the Mediterranean peninsulas from long-distance trade. The foci of growth were located in just a few of the Mediterranean lands, where cities that were located near the sea or navigable rivers became centres of manufacture and trade. H.W. Pleket used the term 'capitalistic niches' in this regard. One last time, we may compare the Roman world to early modern Europe. The Dutch historian Jan Luiten van Zanden observed that economic growth in Europe was limited to those regions that at certain times became the nodal points of the international commercial network.¹⁰ Nothing much seems to have changed.

⁹ Pleket (1993a); Morley (1996).

¹⁰ Van Zanden (1996) 62: 'Economische groei beperkte zich tot die regio's die op gegeven momenten de knooppunten van het internationale handelsnetwerk vormden.'

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